CONFIDENTIAL

SERVICE MANUAL

Impact Receipt Printer

BTP-M280

Shandong New Beiyang Information Technology Co., Ltd.

Revision Sheet

Date	Version No.	Description	Distributor
2007-05-16	V1.0	Release	Mr. zheng lei Mr. zhao zhenxing Mr. Yao Xingmao Mr. Yu zhuanlong
2008-2-20	V1.01	Adjust the format of 1.2	Mr. Yu zhuanlong

Declaration

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Warning and Caution

⚠ Warning: Items shall be strictly followed to avoid damages to body and equipment.

⚠ Caution: Items with important information and prompts for operating the printer.

The quality control system of SNBC has been approved of the following certification.

ISO 9001 REGISTERED DNV MGMT. SYS. RvA C 024 DNV Certification B.V., The Netherlands

(DNV)ISO9001:2000

The environmental control system of SNBC has been approved of the following certification.

ISO 14001 REGISTERED DNV MGMT. SYS. RvA C 425 DNV Certification B.V., The Netherlands

(DNV)ISO14001:2004

Notes

1) Use this manual to troubleshoot printer faults.
2) Do not plug or pull out the signal cable, change print head or do maintenance to the printer when the printer and the computer are powered on.
3) Please take anti-static application when you maintain print head and other electronics component.
4) After turning off the printer, you should wait for at least 20 seconds if you want to turn on the printer again.
5) Do not print without paper and ribbon; otherwise you may damage the print head iron mat and print head.

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1 Features and Specifications

1.1 Features

The BTP-M280 is a 9 pin serial dot matrix receipt impact printer. Features include such as good print quality, high speed printing and stable performance. It is widely used for receipt applications such for POS, Kitchen and Finance terminal.

The BTP-M280 can be connected to host computers via a Serial interface, Parallel interface, USB interface, Ethernet interface, WLAN interface. USB is the standard interface and other interfaces are optional.

The BTP-M280 offers drivers and applications under WINDOWS 98/NT4.0 /2000/2003/XP/Vista.

1.2 Technical Specifications

<table>
<tr><th colspan="2">Item</th><th colspan="5">Specification</th></tr>
<tr><td colspan="2">Print mode</td><td colspan="5">9-pin serial impact dot matrix</td></tr>
<tr><td colspan="2">Print speed</td><td colspan="5">Max. 4.7LPS (400 dots/line)</td></tr>
<tr><td colspan="2">Print width</td><td colspan="5">Max. 400(half dots)/200(full dots)</td></tr>
<tr><td rowspan="3">Paper</td><td>Paper type</td><td colspan="5">Continuous paper or marked paper</td></tr>
<tr><td>Single layer</td><td colspan="5">Paper width: 80±0.5mm, 76±0.5mm, 69.5±0.5mm, 57.5±0.5mm;
Paper thickness: 0.06—0.085mm</td></tr>
<tr><td>Multi-layer paper
(1 original+1 copies)</td><td colspan="5">Paper width: 80±0.5mm, 76±0.5mm, 69.5±0.5mm, 57.5±0.5mm;
Paper thickness: 0.05—0.08mm, total thickness≤0.14 mm</td></tr>
<tr><td rowspan="6">Character</td><td>Character type</td><td colspan="5">Font A: 9×9 Font B: 7×9 Chinese: 16×16</td></tr>
<tr><td rowspan="4">Characters/line (Default)</td><td></td><td>80/76mm</td><td>69.5mm</td><td>57.5mm</td></tr>
<tr><td>Font A</td><td>33 CPL</td><td>30 CPL</td><td>25 CPL</td></tr>
<tr><td>Font B</td><td>40 CPL</td><td>36 CPL</td><td>30 CPL</td></tr>
<tr><td>Chinese</td><td>22 CPL</td><td>20 CPL</td><td>16 CPL</td></tr>
<tr><td>Character size (Default)</td><td colspan="5">Font A: 1.6×3.1mm Font B: 1.2×3.1mm Chinese: 2.7×2.9mm</td></tr>
<tr><td>Characters/inch (Default)</td><td colspan="5">Font A: 13.3CPI Font B: 16CPI Chinese: 8.9CPI</td></tr>
<tr><td rowspan="3">Data buffer</td><td>Receive buffer</td><td colspan="5">8KB</td></tr>
<tr><td>NV bit image data area</td><td colspan="5">128KB</td></tr>
<tr><td>User NV memory</td><td colspan="5">8KB</td></tr>
<tr><td colspan="2">Ribbon specification</td><td colspan="5">ERC-38 ribbon cartridge</td></tr>
<tr><td colspan="2" rowspan="3">Ribbon lifetime</td><td>ERC-38(P)</td><td colspan="4">4,000,000 characters</td></tr>
<tr><td>ERC-38(B)</td><td colspan="4">3,000,000 characters</td></tr>
<tr><td>ERC-38(B/R)</td><td colspan="4">Black: 1,500,000 characters
Red: 750,000 characters</td></tr>
<tr><td colspan="2">Communication interface</td><td colspan="5">USB (Fixed) + IEEE1284/RS-232/Ethernet / Wi-Fi interface (optional)</td></tr>
<tr><td colspan="2">Cash drawer connector</td><td colspan="5">1～2 cash drawers</td></tr>
<tr><td colspan="2">Power supply</td><td colspan="5">DC 24V±5% average current 1.5 A</td></tr>
<tr><td rowspan="3">Reliability</td><td>Printing Mechanism lifetime</td><td colspan="5">10,000,000 lines</td></tr>
<tr><td>Print head lifetime</td><td colspan="5">150,000,000 characters</td></tr>
<tr><td>Cutter</td><td colspan="5">1,500,000 times(partial cut, paper thickness:0.07mm)
1,000,000 times(full cut , paper thickness:0.07mm)</td></tr>
<tr><td colspan="2">Operating temperature and humidity</td><td colspan="5">5～45℃，20～90%RH (40℃)</td></tr>
<tr><td colspan="2">Storage temperature and humidity</td><td colspan="5">-40～60℃，20%～93%RH (40℃)</td></tr>
<tr><td colspan="2">Dimensions</td><td colspan="5">160mm(W)×245mm(D)×145mm(H)</td></tr>
<tr><td colspan="2">Weight</td><td colspan="5">2.9kg</td></tr>
</table>

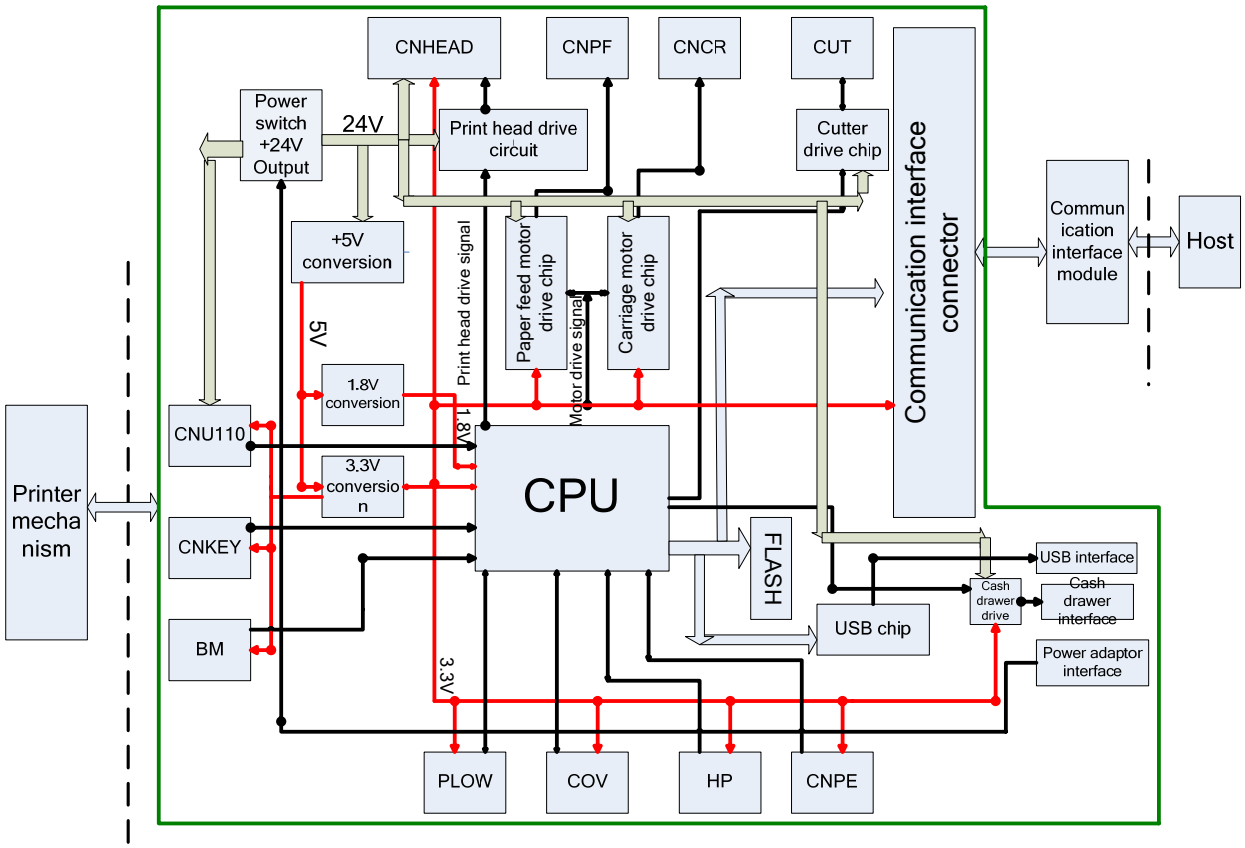
2 Printer Overview

The BTP-M280 printer consisits of the following parts:

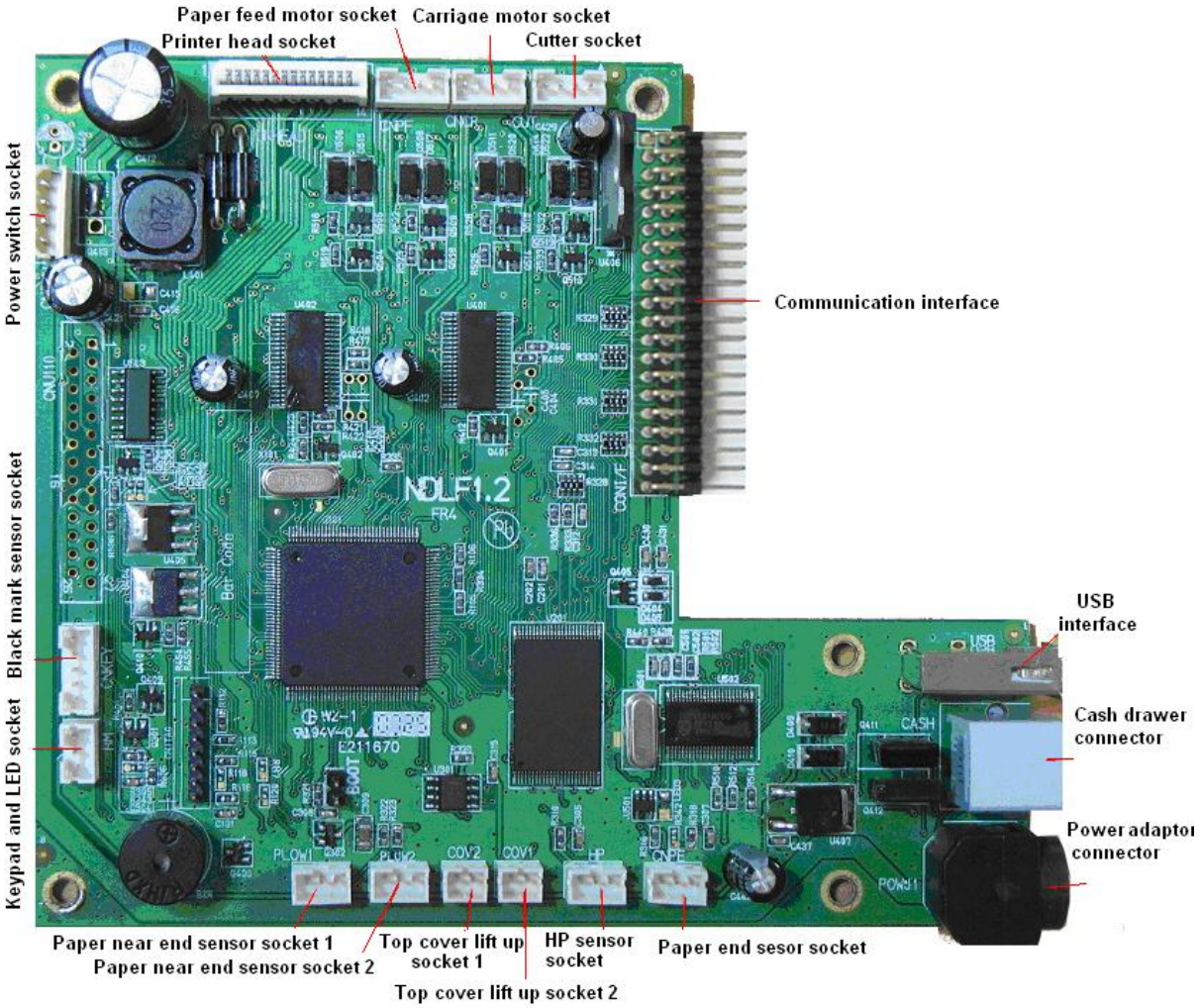
Pinter mechanism part, NDLF main control board, extended interface board.

2.1 Main Control Board Unit Block Diagram

Main control board unit block diagram is shown as below:



Main Control Board Unit Block Diagram



Position of all the sockets in the main control board

3 Main Control Board Description

BTP-M280 can be connected to another device with USB, serial, parallel, Ethernet or WIFI interface. The USB interface is fixed and other is optional.

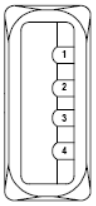
3.1 USB interface

3.1.1 Parameter

- Data transfer：Supports USB1.1 Protocol
- Socket： USB A type standard socket

3.1.2 Interface signal

Pin	Signal	Function
1	VBUS	+5V
2	DATA-	Data-
3	DATA+	Data+
4	GND	Ground



3.1.3 USB interface connection

Host Printer

VBUS.....…VBUS

DATA- .....…DATA-

DATA+..... DATA+

GND .....GND

3.2 Serial interface

3.2.1 Parameter

- Data transmission： Asynchronous serial communicate
- Handshaking： DTR/DSR or XON/XOFF
- Voltage： MARK = -3 to -15V： Logic "1"/ OFF
- SPACE = +3 to +15V：Logic "0"/ ON
- Baud rate： 1200, 2400, 4800, 9600, 19200, 38400, 57600 bps
- [bps: bits per second]
- Data bit： 7 bit or 8 bit
- Parity bits： No
- Stop bit： 1 bit or 2 bit
- Socket： D-SUB 25PIN hole socket

Notice：

Handshaking, baud rate, data bit and stop bit can be set by EEPROM and feed button.

3.2.2 Interface connection and signal function

Signal and function：

Pin	Signal Name	Signal Direction	Function
1	FG	—	Frame ground
2	TXD	OUTPUT	Data output
3	RXD	INPUT	Data input
4	RTS	OUTPUT	Ask for sending
6	DSR	INPUT	Host ready
7	SG	—	Signal ready
20	DTR	OUTPUT	Data terminal ready

3.2.3 Serial connection

Host Printer

TXD----------RXD

RXD----------TXD

DSR----------DTR

CTS----------RTS

RTS----------CTS

DTR----------DSR

FG ----------FG

SG ----------SG

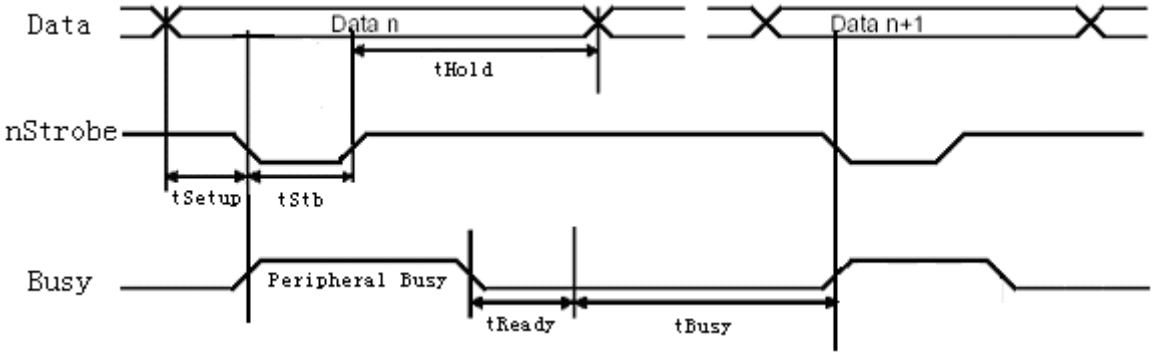
3.3 Parallel interface

Parallel interface works under IEEE1284 compatible mode and bi-direction mode.

3.3.1 Parameter

- Data transmission： 8 bit parallel
- Synchronized mode： Externally supplied nStrobe signals
- Handshaking mode： Busy Signal
- Handshaking pressure： TTL compatible
- Connector： IEEE 1284-B(CENTRONICS) socket

3.3.2 Time Sequence of the Parallel Interface Module



Time Sequence of Parallel Interface（Compatible mode）

Signal	Min.	Max.
tSetup	750	-
tReady	0	-
tStb	750	-
tBusy	0	500
tHold	750	-

Time Request of Parallel Interface

3.3.3 Pin assignment

Pin	Signal source	Signal definition	Pin	Signal source	Signal definition
1	H	nStrobe	19		Signal Ground
2	H	Data 0 (Least Significant Bit)	20		Signal Ground
3	H	Data 1	21		Signal Ground
4	H	Data 2	22		Signal Ground
5	H	Data 3	23		Signal Ground
6	H	Data 4	24		Signal Ground
7	H	Data 5	25		Signal Ground
8	H	Data 6	26		Signal Ground
9	H	Data 7 (Most Significant Bit)	27		Signal Ground
10	P	Ack	28		Signal Ground
11	P	Busy	29		Signal Ground
12	P	PError	30		Signal Ground
13	P	Select	31	H	nInit
14	H	nAutoLF	32	P	nFault
15		Not defined	33		Signal Ground
16		Logic Gnd	34		Not defined
17		Chassis Gnd	35		Not defined
18	P	Peripheral Logic High	36	H	nSelectIn

Parallel Interface Pin Assignment

Notice：

- H stands for host end, P stands for printer end.
- Parallel interface signal adopting TTL pressure. Please make sure that both ascending and descending time of the host end are less than 0.5μs when using the printer to print.
- When data transmitting, the host end should not neglect the Busy signal, otherwise the printing data will be lost.
- The parallel interface signal cable should be as short as possible.

3.3.4 Parameter

DC Characteristics (Except Logic-H, +5 V signals)

Characteristics	Symbol	Specifications		Conditions
		Min	Max	
Output HIGH voltage	VOH	*2.4 V	5.5 V	*IOH=0.32 mA
Output LOW voltage	VOL	-0.5 V	*0.4 V	*IOL=-12 mA
Output HIGH current	IOH	0.32 mA	-	VOH=2.4 V
Output LOW current	IOL	-12 mA	-	VOL=0.4 V
Input HIGH voltage	VIH	2.0 V	-	
Input LOW voltage	VIL	-	0.8 V	
Input HIGH current	IIH	-	-0.32 mA	VIH=2.0 V
Input LOW current	IIL	-	12 mA	VIL=0.8 V

Logic-H Signal Sender Characteristics

Characteristics	Symbol	Specifications		Conditions
		Min	Max	
Output HIGH voltage	VOH	3.0 V	5.5 V	
Output LOW voltage	VOL	-	2.0 V	While the power is OFF

+5 V Signal Sender Characteristics

Characteristics	Symbol	Specifications		Conditions
		Min	Max	
Output HIGH voltage	VOH	*2.4 V	5.5 V	*IOH=0.32 mA
Output LOW voltage	VOL	-	- **	While the power is OFF
Output HIGH current	IOH	-	0.32 mA	VOH=2.4 V
Output LOW current	IOL	- **	-	While the power is OFF

** No guarantee is offered to VOL and IOL while the power is OFF.

3.3.5 Effect of printer's status on parallel interface

Status	/nFault	PE
Normal status	High	Low
Paper end	Low	High
Rear cover open	Low	Low
Cutter error	Low	Low
Input voltage abnormal	Low	Low
Print head overheated	Low	Low
HP error	Low	Low

Notice：

When the above error occurs, user can inquire the printer's status from the Pin of parallel.

3.4 Ethernet interface

3.4.1 Interface character

- Support 10BASE-T communicate
- Ethernet II frame type compatible
- LED indicates the net connection status and data transmission status
- Support 9100 port printing
- Support auto status back

- Support parameter configuration
- Support firmware update online
- Support printer status inquire and interface module maintenance based in HTTP mode

3.4.2 Protocol supported

- IP
- ARP
- ICMP
- TCP
- UDP
- DHCP
- TFTP
- HTTP

3.4.3 Electrical character

Output signal：

- Available differential mode voltage is bigger than 450Mv and peak voltage is no more than 13V.
- Peak voltage of common mode voltage is no more than 2.5V.

Input signal:

The signal is effective only when the differential mode voltage is bigger than 160mv.

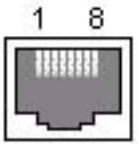
3.4.4 Frame type

Ethernet II frame type compatible.

3.4.5 Pin assignment

The interface use 10BASE-T standard which comply to IEEE802.3.

Pin	Signal Name	Description
1	TX+	Data sending +
2	TX-	Data sending-
3	RX+	Data receiving+
4	NC	Reserved
5	NC	Reserved
6	RX-	Data receiving-
7	NC	Reserved
8	NC	Reserved



3.5 WLAN Interface

3.5.1 Interface character

- Support 802.11b/g protocol
- Support 9100 port printing and LPR printing
- Support auto status back
- Easy configuration
- Firmware update online
- Support HTTP function

3.5.2 Protocol supported

- IP
- ARP
- ICMP
- TCP
- UDP
- DHCP
- TFTP
- HTTP

3.5.3 Electrical character

Comply to 802.11b/g protocol.

4 Disassembly and Assembly

Cautions:

1) Do not disassemble, assemble or adjust the printer if it works properly. Do not loosen any screw unless necessary.
2) When disassembling and assembling, avoid damaging all wires and cables. Do not place them in a narrow space or improper position.
3) When handling the print head or electronic component, make sure to take some measures to protect it from electrostatic charge.
4) During maintenance, be careful not to leave parts or screws loose inside the printer.
5) During maintenance, be careful not to damage the print head surface and the HP iron mat.

4.1 Maintenance Tools

Maintenance Tools:

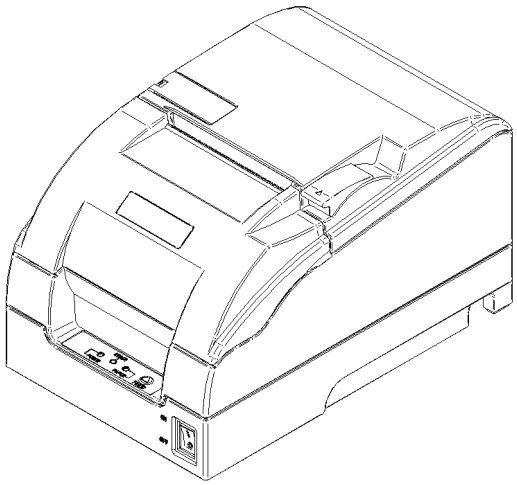
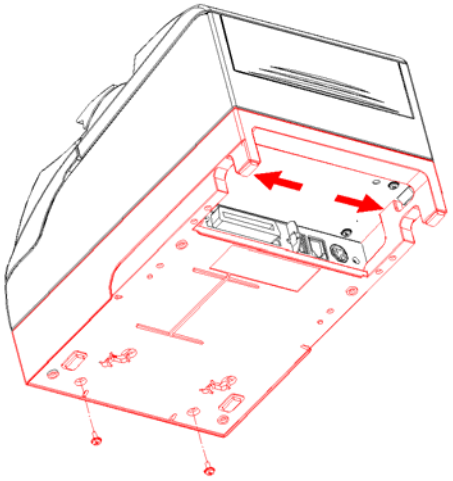
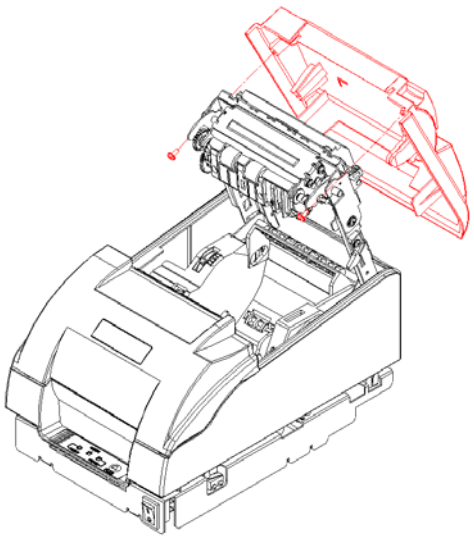
- Screw Driver (Cross-shaped type)
- Sharp-nose pliers
- Wire clamp pliers

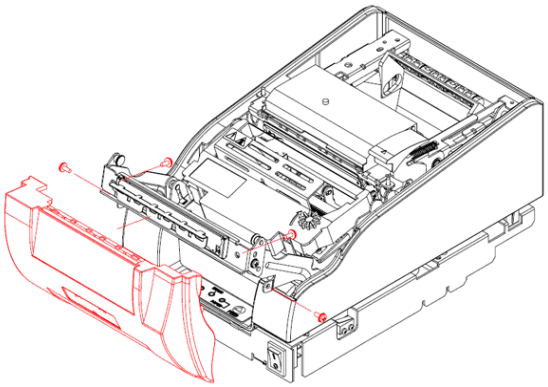
Assistant materials:

- Lubricant
- Alcohol
- Absorbent cotton

4.2 Disassemble the Printer

4.2.1 Disassemble the Cover of Printer

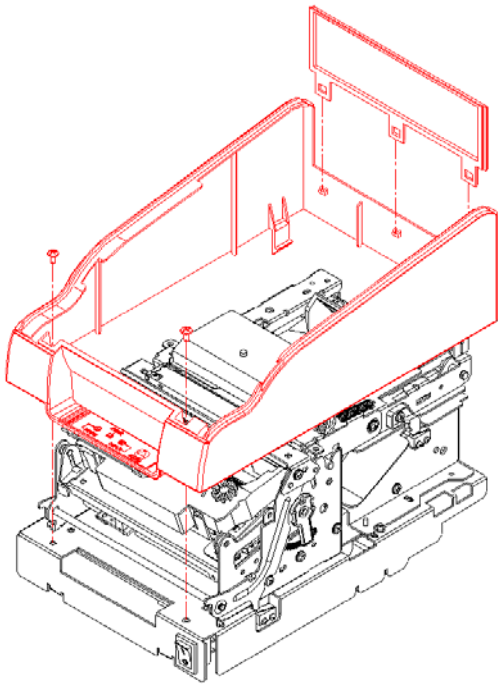
Pictures	Instructions
	Top view of printer.
	1) Unscrew the two screws (M3x7) as shown with the screw driver; 2) Push the lock frame of lower cover with a moderate force as the arrow shown in the figure and take it off. **Note:** Please use a moderate force to avoid damage to the lower cover when disassembling the lock frame.
	1) Unscrew the two screws (2.9x8) as shown with the screw driver; 2) Push the lock frame of upper cover with a moderate force as shown and take it off. **Note:** Please use a moderate force to avoid damage to the upper cover when disassembling the upper cover.



Unscrew the four screws (Four ST2.9x6) as shown with the screw driver and take the front cover off.

Note:

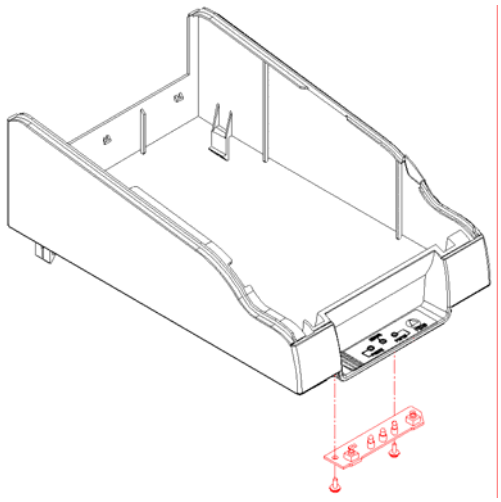
Please use a moderate force to avoid damage to the font cover when disassembling the front cover.



1) Unscrew the two screws (M3x7) as shown with the screw driver;
2) Unplug the connection wire of Feed button and that of main control board;
3) Push the lock frame of middle cover with a moderate force as shown and take it off;
4) Take the middle cover holder off with a moderate force.

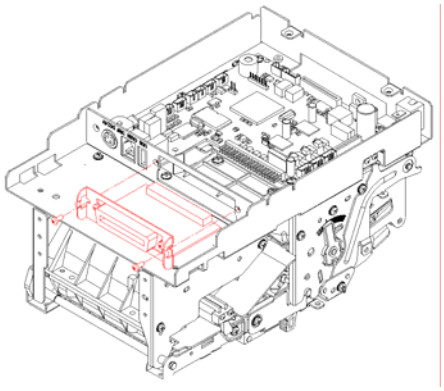
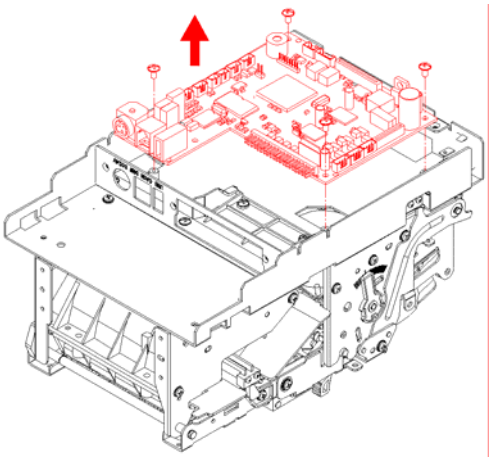
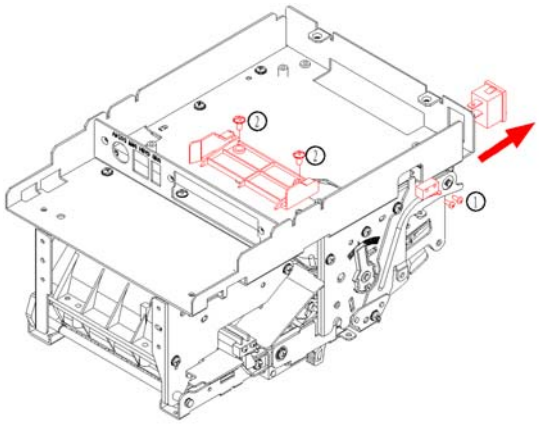
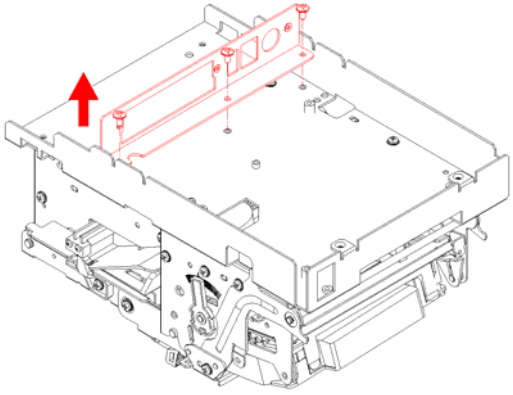
Note:

- Please use a moderate force to avoid damage to the middle cover when disassembling the lock switch;
- Please do not pull the connection wire to avoid damage to the wire when pluging and unplugging the connection wire.

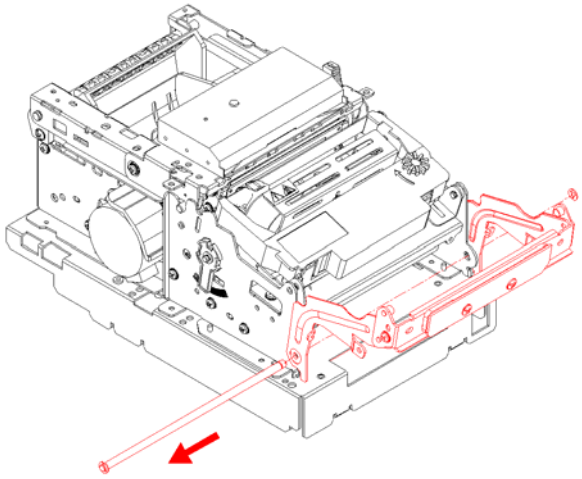
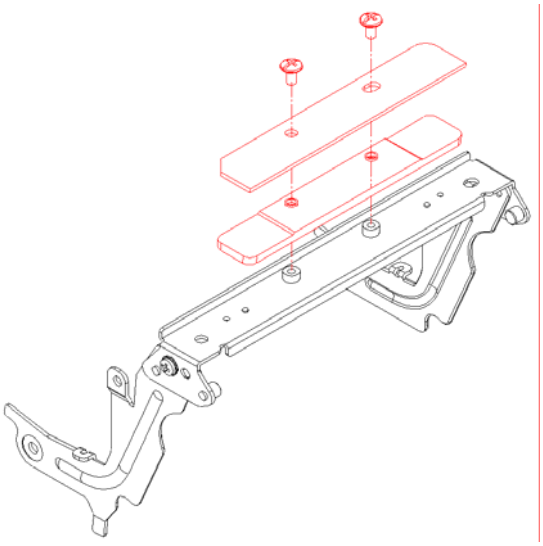
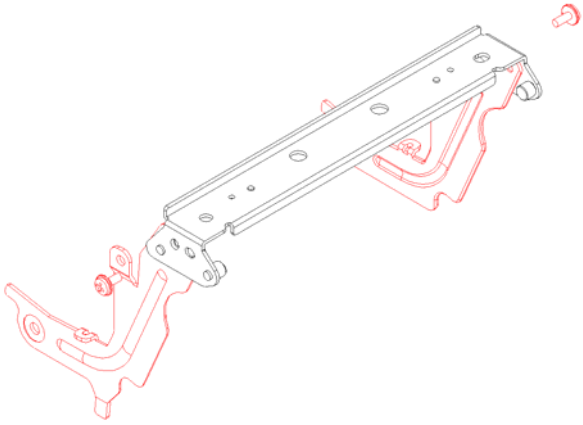


Unscrew the two screws (ST2.9x6) as shown with the screw driver and take the Feed button board off.

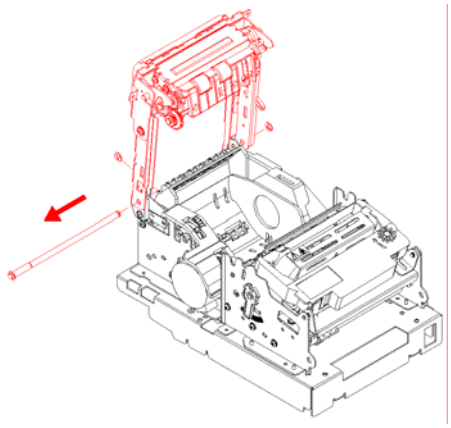
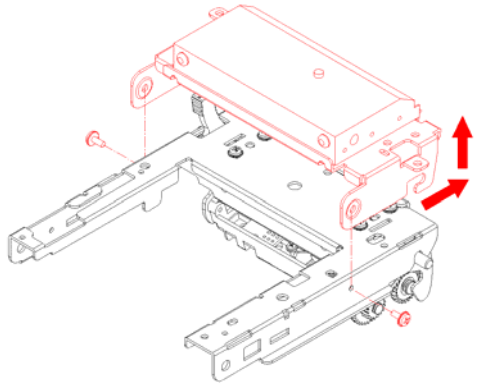
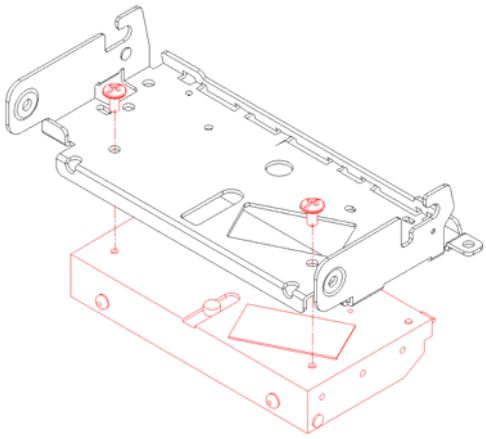
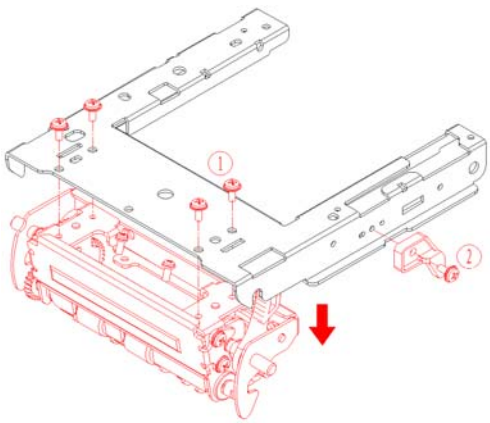
4.2.2 Disassemble the Main Control Board Cover

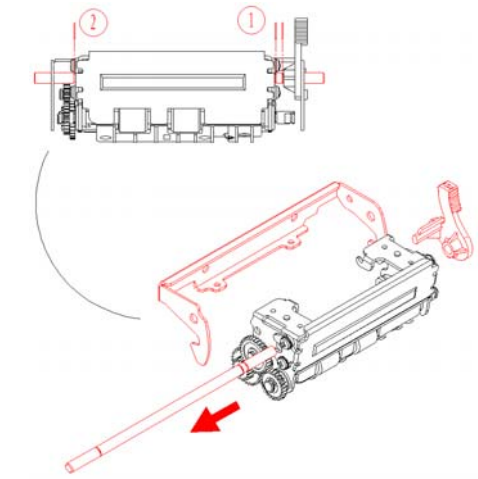
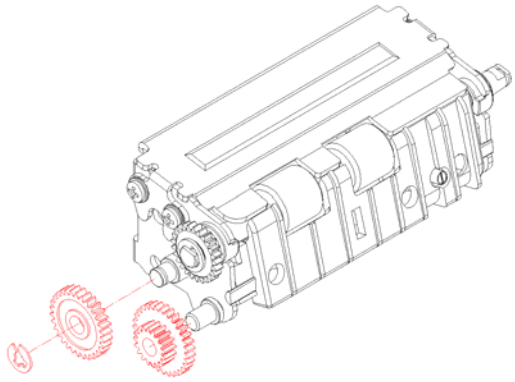
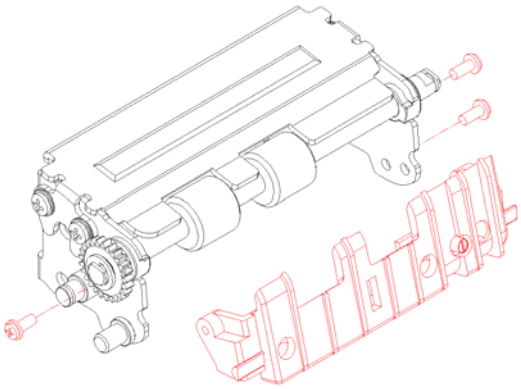
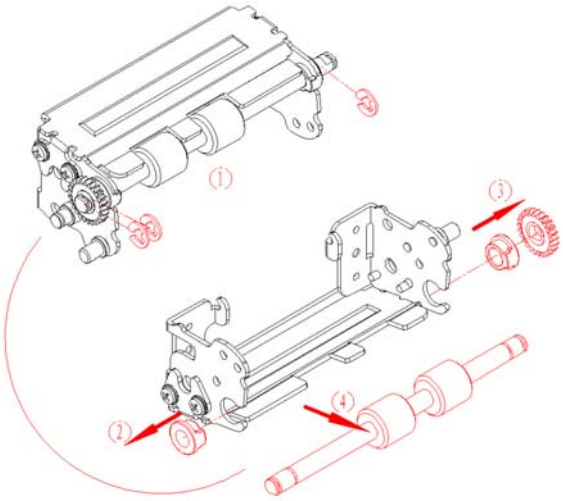
Pictures	Instructions
	Unscrew two screws (M2.5x5) as shown and take the interface module off. **Note:** Please use a moderate force to avoid bending the interface connector pins when connecting or disconnecting the interface board.
	1) Unplug all the wires in the main control board with a moderate force; 2) Unscrew the four screws (M3 x 5) with the screw driver and take the board off. **Note:** ■ Please keep the main control board safely to avoid scratching and short circuit. ■ Please do not pull the connection wire to avoid damaging the wire when pluging and unplugging the connection wire.
	1) Unscrew the two screws (M2x8) as shown item ① of the figure with the screw driver and take the micro switch off; 2) Unscrew the two sink screws (M3x5) as shown item ② of the figure with the screw driver and take the guide plate off; 3) Take the power switch off as the arrow shown in the figure.
	Unscrew the three screws (M3x5) as shown with the screw driver and take the interface plate off as the arrow shown in the figure.

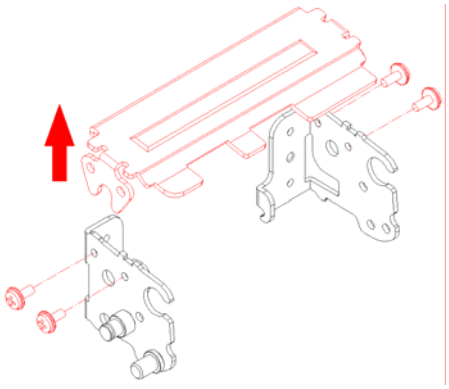
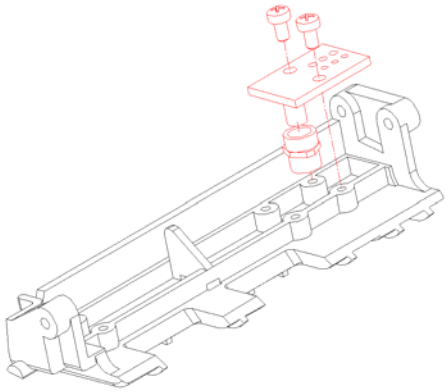
4.2.3 Disassemble the Stationary Blade Cutter Module

Pictures	Instructions
	Offload one E-ring from one side of the stationary blade shaft with the sharp-nose pliers and pull the shaft as the arrow shown in the fugure, take the stationary blade module off.
	Unscrew the two screws (M3x5) as shown with the screw driver, separate the cutter holder and the stationary blade. **Note:** ■ Handle the stationary blade carefully to avoid injury. ■ Handle the stationary blade carefully to avoid damaging the blade with hard material.
	Unscrew the two screws (ST2.9x6) as shown with the screw driver, separate right holder and the left holder of the stationary blade.

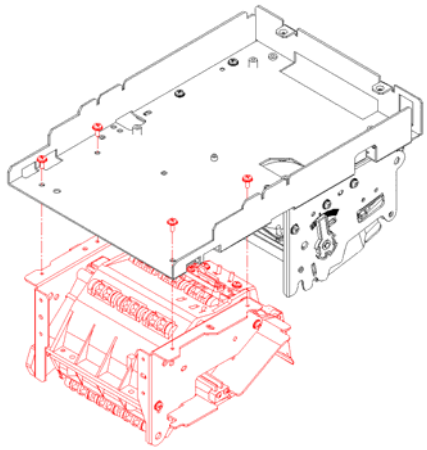
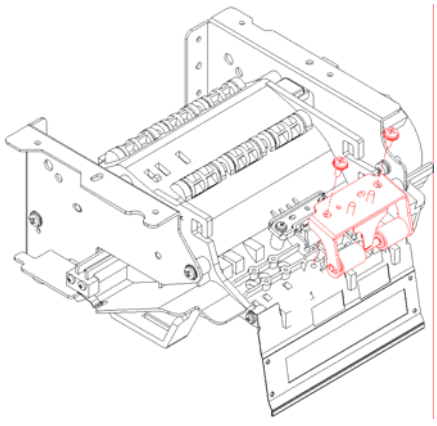
4.2.4 Disassemble the Platen Roller Module (Without Rewinder)

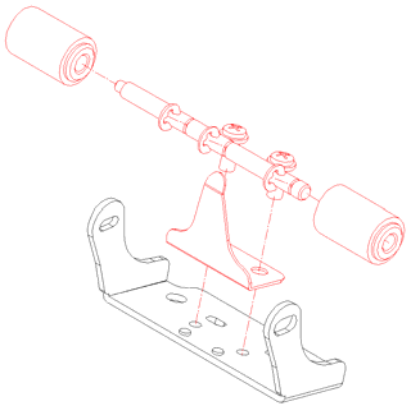
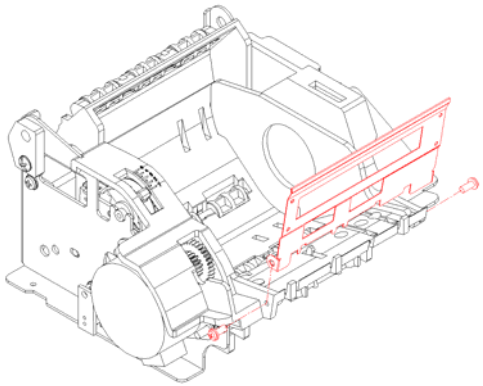
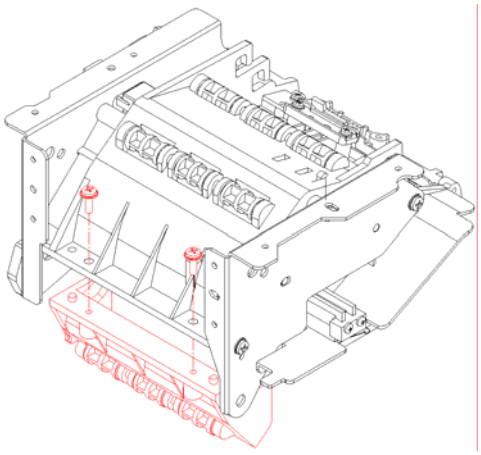
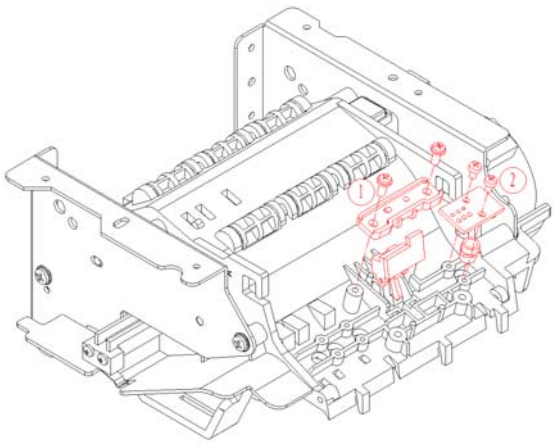
Pictures	Instructions
	1) Cut off the tie wire of the cutter wire with wire clamp pliers; 2) Offload the E-ring in the side of the back shaft and the E-ring in the middle with sharp-nose pliers, pull the back shaft as the arrow shown in the figure, take the platen roller module off (without rewinder).
	1) Unscrew the two screws (ST2.9x6) as shown with the screw driver. 2) Move the moving blade as the arrow shown in the figure (Move forward and then move upward), separate the moving blade module.
	Unscrew the two screws (M3x5) as shown with the screw driver, separate the moving blade and moving blade fixed plate.
	1) Unscrew the four screws (ST2.9x6) as shown item ① with the screw driver; 2) Separate the platen roller module as the arrow shown in the figure; 3) Unscrew one screw (ST2.9x6) as shown item ② with the screw driver and take the micro switch press plate off.

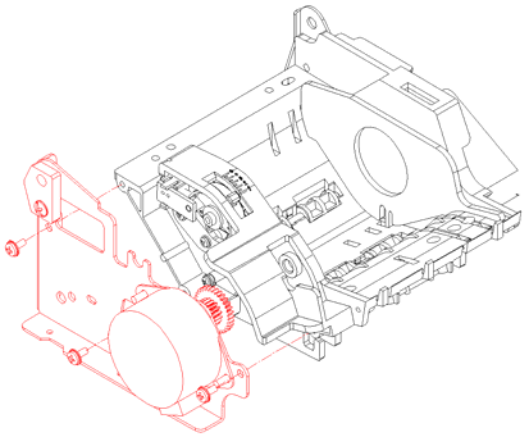
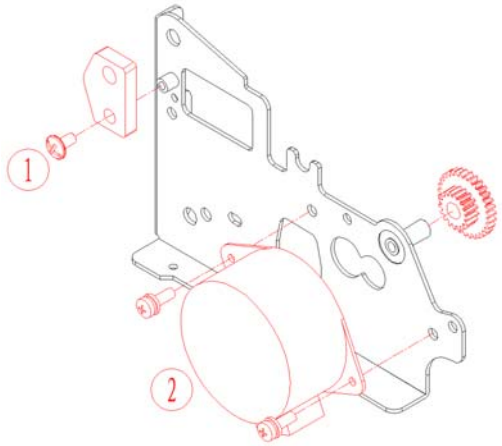
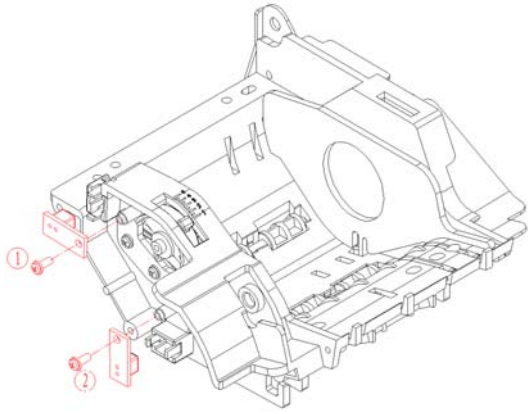
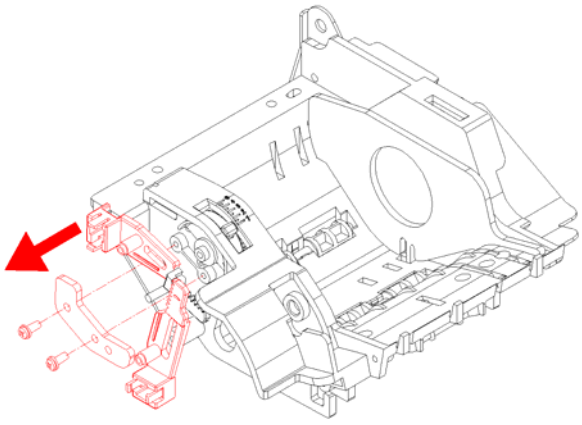
	1) Offload the three E-rings as shown item ① and ② in the figure with the sharp-nose pliers; 2) Pull the latch shaft as the arrow shown in the figure, separate the latch and cover spanner.
	1) Offload one E-ring as shown in the figure with the sharp-nose pliers; 2) Separate the transition gear and gear 31-17.
	Unscrew the three screws (ST2.6x6) as shown with the screw driver and take the upper channel plate off.
	1) Offload the three E-rings as shown item ① in the figure with the sharp-nose pliers; 2) Take one bush off as the arrow shown item ② in the figure; 3) Take one platen roller gear and one bush off as the arrow shown item ③ in the figure; 4) Take one platen roller off as the arrow shown item ④ in the figure.

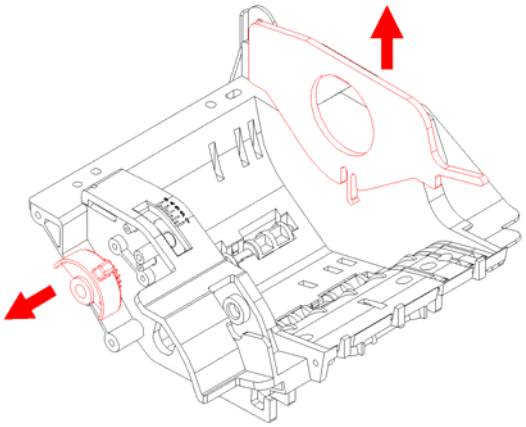
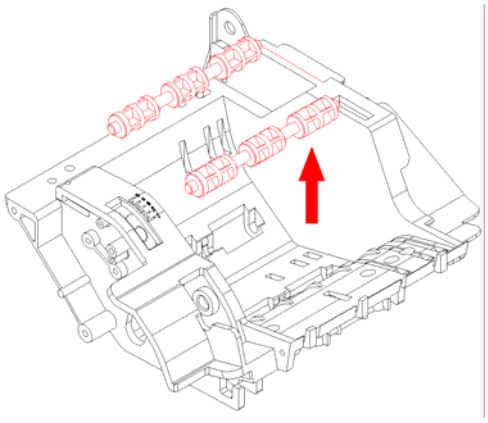
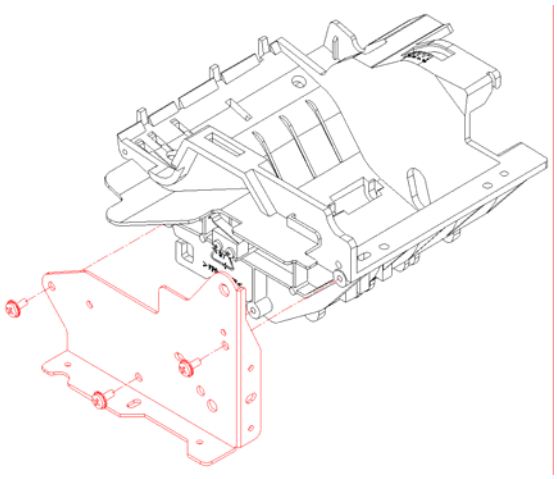
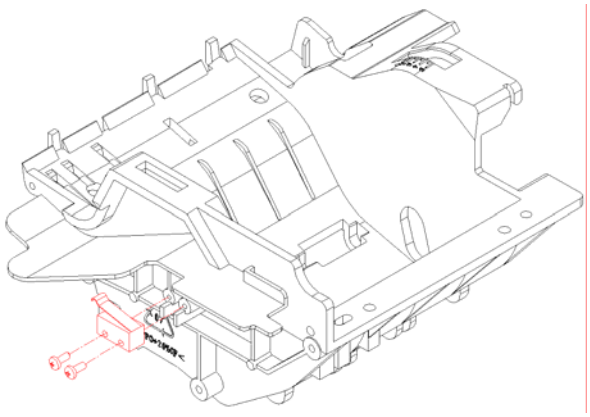
	Unscrew the four screws (ST2.9x6) as shown with the screw driver and take the print padding plate off.
	When equipped the black mark sensor, unscrew the two screws (ST2.2x4) as shown with the screw driver, separate the black mark sensor and sensor dustproof cover off.

4.2.5 Disassemble the Paper Cabinet Module

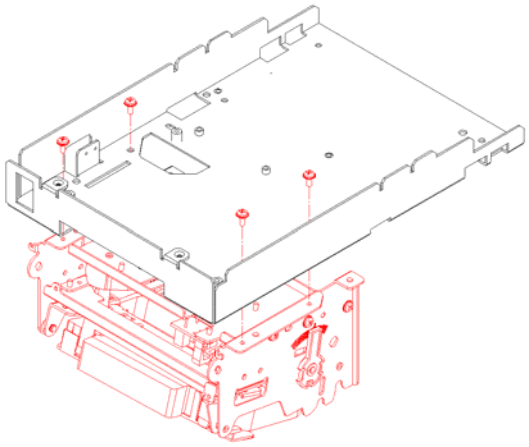
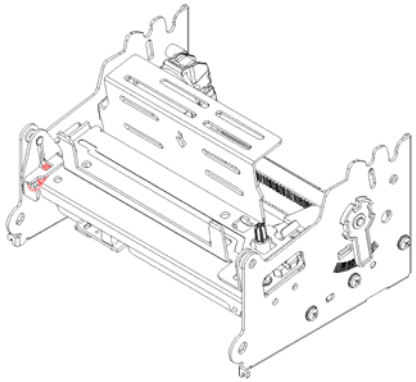
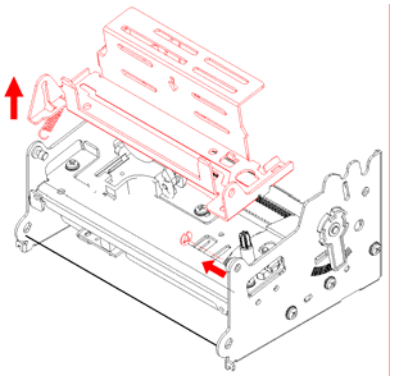
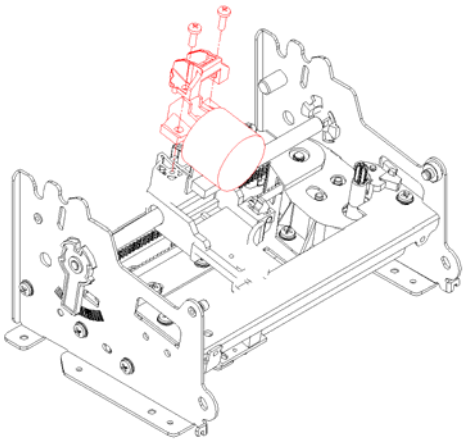
Pictures	Instructions
	1) Cut off the tie wire of all wires with wire clamp pliers; 2) Unscrew the four screws (ST2.9x6) as shown with the screw driver and take the paper cabinet module off from the main control board box.
	Unscrew the two screws (ST2.9x6) as shown with the screw driver and take the floatable wheel plate module off.

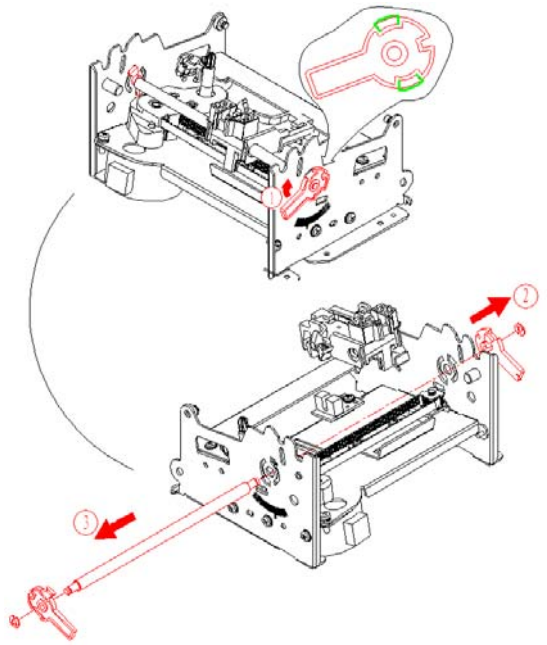
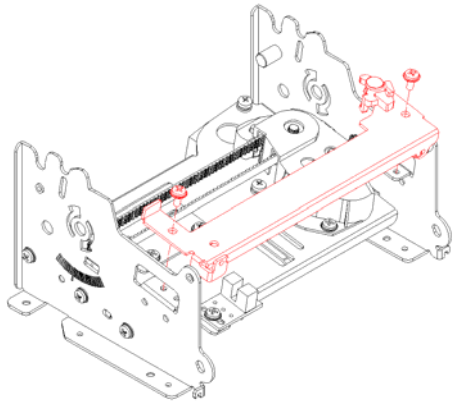
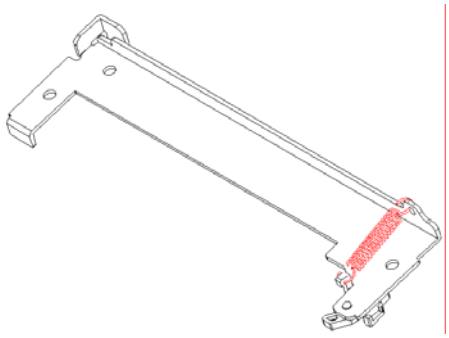
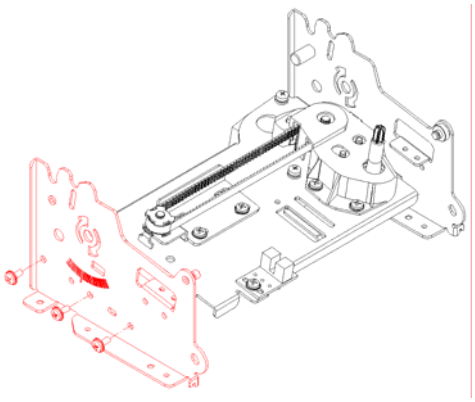
	1) Offload the three E-rings as shown with the sharp-nose pliers, separate the floatable wheel shaft and floatable wheel; 2) Unscrew the two screws (ST2.6x6) with the screw driver and take the carriage spring plate off.
	Unscrew the two screws (ST2.6x6) with the screw driver and take the paper force spring plate off.
	Unscrew the two screws (ST2.9x6) with the screw driver and take the vertical paper cabinet off.
	1) Unscrew the two screws (ST2.6x6) as item ① shown in the figure with the screw driver, separate the paper end sensor and paper end sensor press plate. 2) When euipped the black mark sensor, unscrew the two screws (ST2.2x4) as item ② shown in the figure with the screw driver, separate the black mark sensor and sensor dustproof cover.

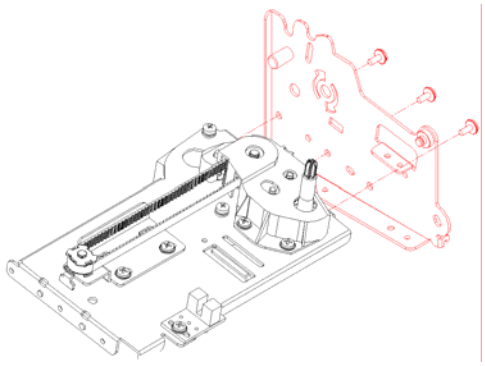
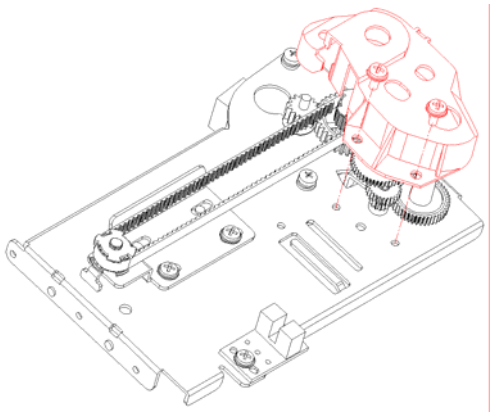
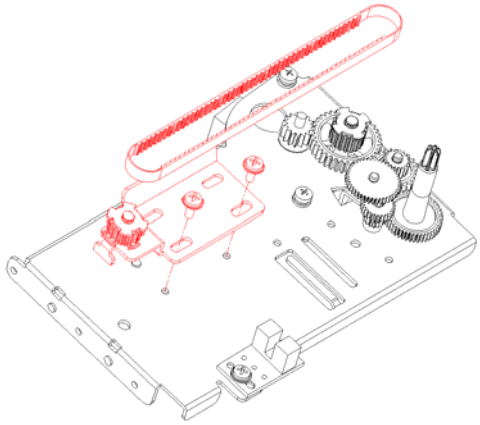
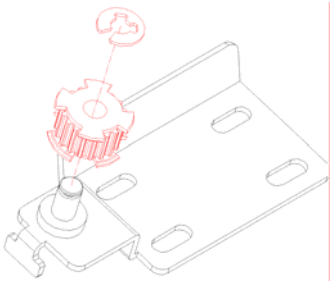
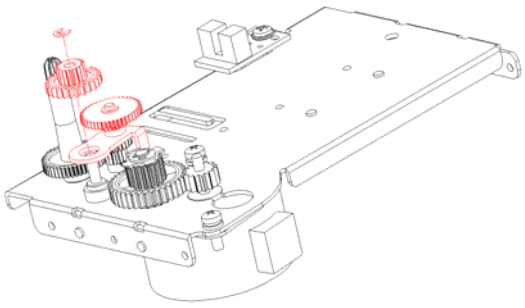
	Unscrew the three screws (ST2.9x6) with the screw driver and take the right plate of paper cabinet off.
	1) Unscrew one screw (M3x6) as item ① shown in the figure with the screw driver and take damping washer off; 2) Unscrew the two screws (M3x8) as item ② shown in the figure with the screw driver, take the paper feed motor and gear 31-17 off.
	1) Unscrew one screw (ST2.6x6) as item ① shown in the figure with the screw driver, pull the lock frame in a moderate force outwards and take horizontal paper near end sensor off; 2) Unscrew one screw (ST2.6x6) as item ② shown in the figure with the screw driver, pull the lock frame in a moderate force and take vertical paper near end sensor off.
	1) Unscrew the two screws (ST2.6x4) as shown with the screw driver and take the paper near end sensor press plate off; 2) Separate the horizontal paper near end sensor plate holder and the vertical paper near end sensor hoder as the arrow shown in the figure.

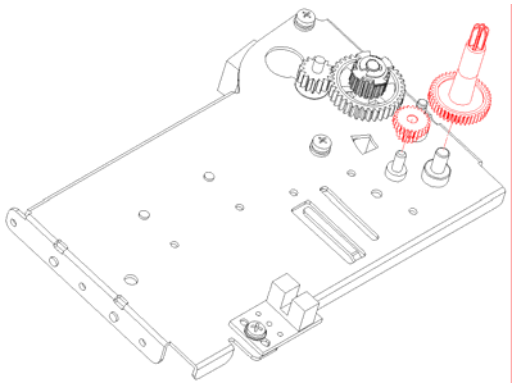
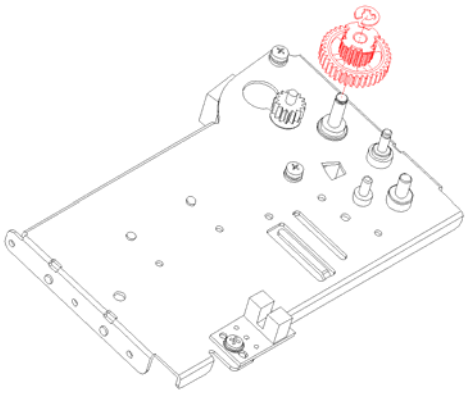
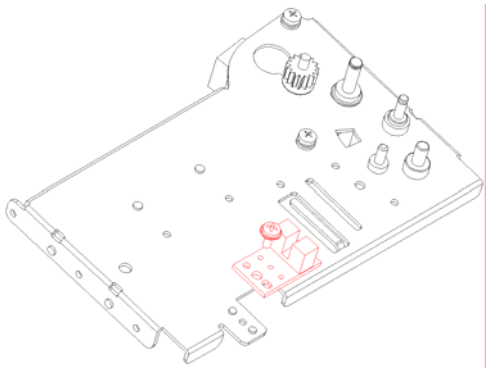
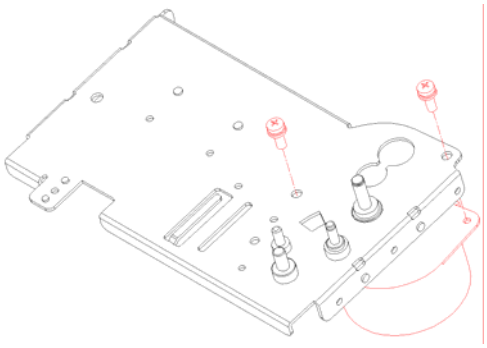
	1) Take the paper guide upwards in a moderate force off as the arrows shown in the figure; 2) Take the paper near end sensor adjustment spanner off as the arrows shown in the figure.
	Take the paper roller platen shaft off as the arrow shown in the figure.
	Unscrew the three screws (ST2.9x6) as shown with the screw driver and take the right plate of paper cabinet off.
	Unscrew the two screws (ST1.7x10) as shown with the screw driver and take the micro switch off.

4.2.6 Disassemble the Print Module

Pictures	Instructions
	Unscrew the four screws (ST2.9x6) as shown with the screw driver and take the print module off.
 	1) Offload the extension spring as shown with the sharp-nose pliers; 2) Offload one E-ring as shown with the sharp-nose pliers; 3) First move the ribbon support plate 4mm to the left side in the horizontal direction as the arrow shown, then lift up the ribbon support plate so as to take the ribbon support plate off.
	Unscrew the two screws (ST2.6x10) as shown with the screw driver, separate the print head and the ribbon direction guide.

	1) Offload the two E-rings at the both sides of the direction guide shaft as shown with the sharp-nose pliers; 2) Turn the eccentric bushing in left and right direction as the arrow ① shown so as to make the eccentric bushing to superpose with the notch of the side plate; 3) Separate the left side eccentric bushing and the right side eccentric bushing as the arrow ②,③ shown; 4) Take the lead shaft off as the arrow ③ shown.
	Unscrew the two screws (ST2.9x6) as shown with the screw driver and take the ribbon support plate module off.
	Offload the extension spring as shown with the sharp-nose pliers.
	Unscrew the three screws (ST2.9x6) as shown with the screw driver and take the left side plate off.

	Unscrew the three screws (ST2.9x6) as shown with the screw driver and take the right side plate off.
	Unscrew the two screws (ST2.9x6) as shown with the screw driver and take gear dustproof cover off.
	Unscrew the two screws (ST2.9x6) as shown with the screw driver, separate the tight plate and sync dentiform belt.
	Offload one E-ring as shown with the sharp-nose pliers and take the tight wheel.
	Offload one E-ring as shown with the sharp-nose pliers, separate the transition gear and balance wheel module.

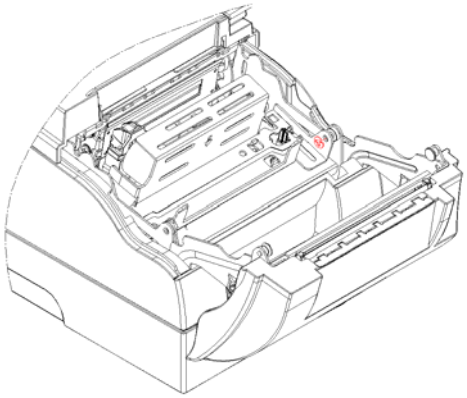
	Offload one E-ring as shown with the sharp-nose pliers and take the gear off.
	Separate upwards the gear 1 and ribbon rotation wheel.
	Offload one E-ring as shown with the sharp-nose pliers and take the driving pulley off.
	Unscrew one screw (ST2.9x6) as shown with the screw driver and take the HP sensor off.
	Unscrew the two screws (M3x8) as shown with the screw driver and take the carriage motor off.

5 Printer maintenance

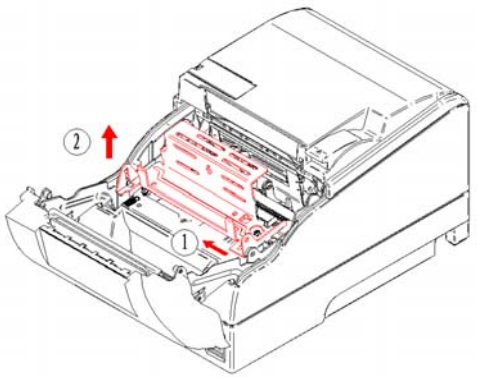
5.1 Main part replacing

5.1.1 Print head replacing

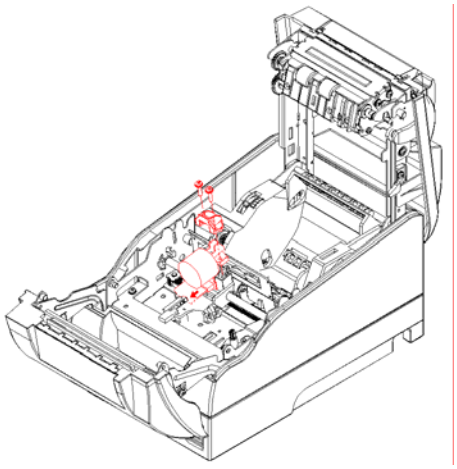
1) Turn off the printer.
2) Open the front cover of printer and take off the ribbon, and then disassemble the E-ring on right side of ribbon support plate as shown in the figure.



3) Move the ribbon holder 4mm in shown direction ① and then lift it in direction ② and take the ribbon spring off, then take off the ribbon holder.



4) Open upper cover, then unscrew the two screws (ST2.6x10) and take off ribbon guide plate, take off the print head from carriage and detach print head cable.



5) Install a new print head following these steps in inverse order.

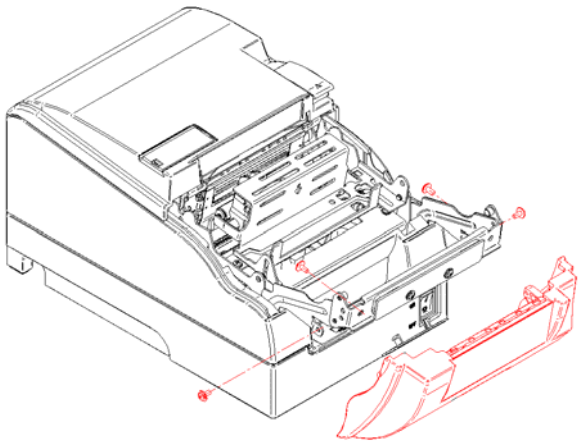
Notice：

- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Print head is thermal part, please disassembly it after cool down.
- Print head is damageable part, please avoid injuring or damage when disassembling or reassembling it.
- Please make sure that the print head cable connects the print head firmly.
- Please take care of the position of cables when connecting it.
- When reassembling the print head, please position the print head on carriage and ribbon correctly and fix the screws firmly.

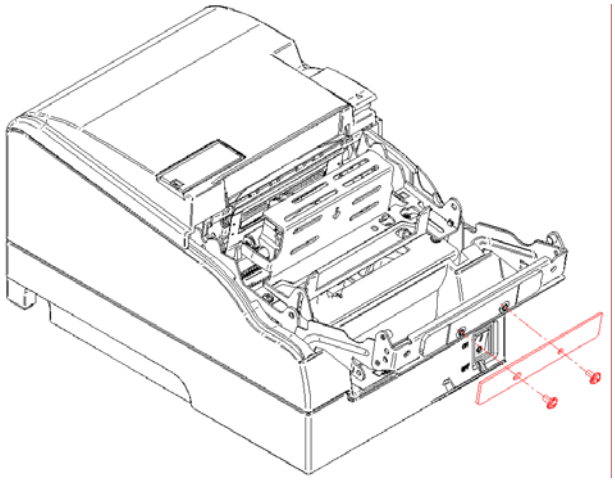
5.1.2 Cutter replacing

➢ **Stationary blade replacing**

1) Turn off the power.
2) After the print head cool down, open the front cover and unscrew the four screws (ST2.9X6) , then take off the front cover.



3) Unscrew the two screws (M3X5) and take the stationary blade off.

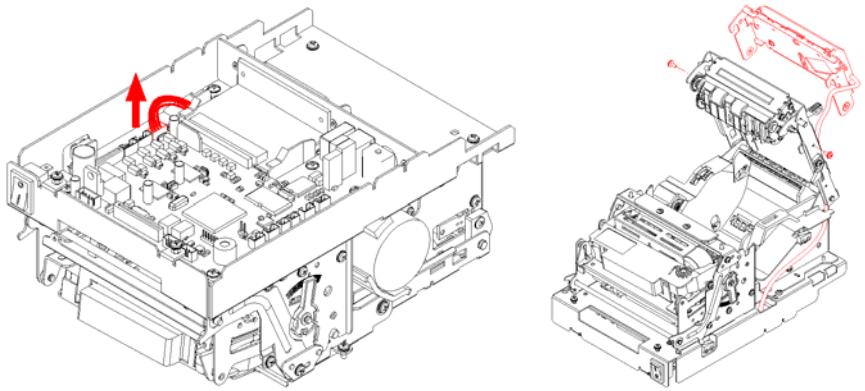


4) Install a new stationary blade and reassemble.

➢ **Moving blade replacing**

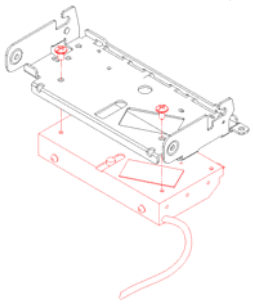
1) Close the power.
2) After the print head cool down, disassemble the cover according to 4.2.1.
3) Cut the cable ties and detach the cutter cable off from the main control board.

4) Unscrew the 2 ST2.9X6 screws and disassemble the cutter fixes plate and moving blade.



5) Unscrew the two screws (M3X5) and take off the moving blade module.

6) Install a new moving blade module and reassemble by following these steps in reverse order.



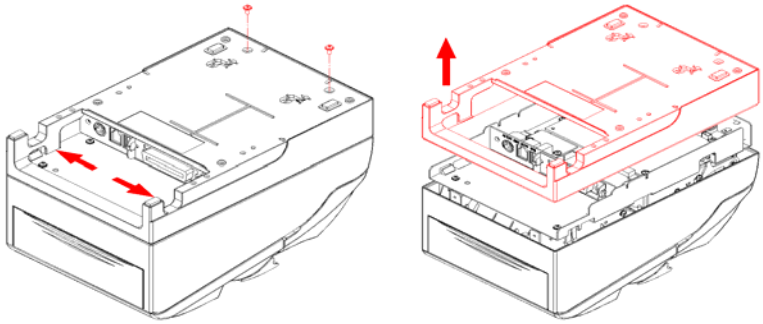
Notice：

- When disassembling the cover, please use moderate force to avoid damage the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Print head is thermal part, please disassembly it after cool down.
- Please make sure that the cutter cable connects into the socket firmly.
- Please avoid crushing the cable in reassembly.
- In reassembling the cutter, please position the cutter on fix plate correctly and fix screws firmly.

5.1.3 Main control board replacing

1) Close the power and detach the communication cable.

2) Unscrew the two screws (M3X7) and push the hook out in shown direction (first Fig), then take the lower cover off in shown direction.



3) Detach all cable connector on main control board, then unscrew the two screws (M2.5X5) and take off the interface board in shown direction, then unscrew the four screws (M3X5) and take off the main control board.

4) Install a new control board and reassemble by following these steps in reverse order.

Notice：

- When disassembling the printer cover, please use moderate force to avoid damage the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Please use moderate force to pull the interface off to avoid damaging the connector.
- Print head is thermal part, please disassembly it after cool down.
- Please make sure that all the connectors connect to their sockets firmly.
- Please avoid crushing the cable in reassembly.
- In reassembling the main control board, please fix all screws firmly.

5.1.4 Paper feed motor replacing

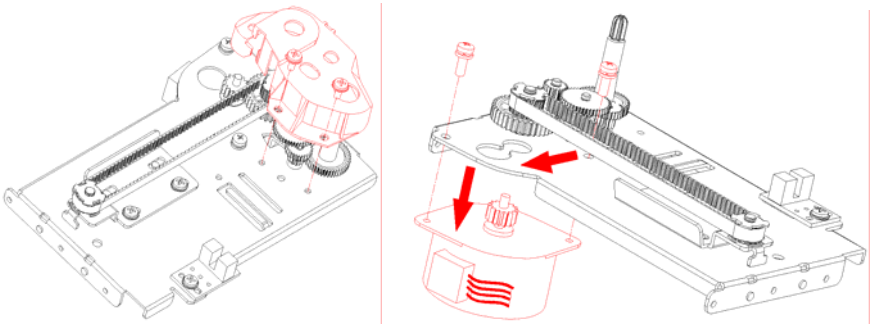
1) Turn off the power.
2) After the print head cool down, disassemble the cover according to steps in 4.2.1；
3) Detach the paper feed motor cable from main control board.
4) Unscrew the two screws (M3X8) and take off the Paper feed motor in thedirection shown.
5) Install a new paper feed motor and reassemble by following these steps in reverse order..

Notice：

- In disassembling the printer cover, please use moderate force to avoid damage the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Please make sure that all the Paper feed motor connectors connect to its socket firmly.
- Please avoid crush the cable in reassembly.
- In reassembling the paper feed motor, please fix all screws firmly.

5.1.5 CR motor replacing

1) Turn off the power.
2) After the print head cool down, disassemble the cover according to steps in 4.2.1.
3) Detach the CR motor, HP sensor and print head cable from the main control board.
4) Disassemble the transmission module according to steps in 4.2.6.
5) Unscrew the 2 ST2.9X6 screws shown in the figure and take off the gear dust proof cover.
6) Unscrew the 2 M3X8 screws, then take the CR motor in shown direction.
7) Install a new CR motor and reassemble.



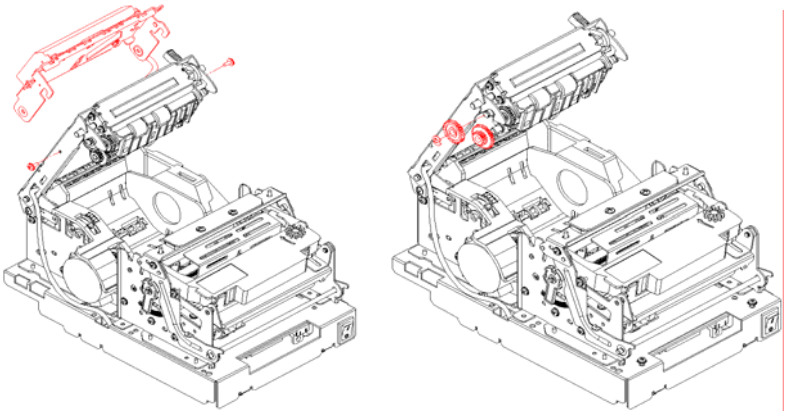
Notices：

- In disassembling the printer cover, please use moderate force to avoid damage the cover.
- Please do not pull the cable when detaching the connector from main control board, so as to avoid breaking the cable.
- Please make sure that all the CR motor connector connects to its socket firmly.

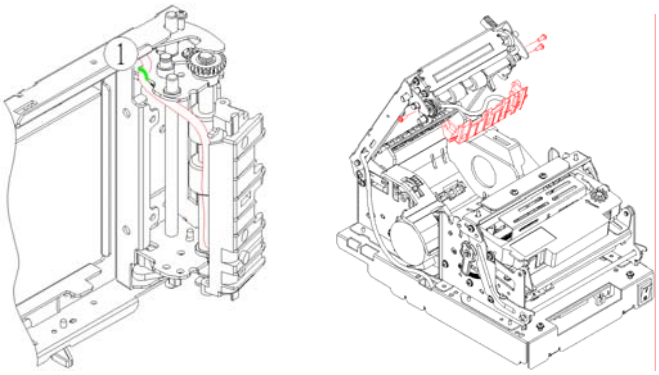
- Please avoid crushing the cable in reassembly.
- In reassembling the CR motor, please fix all screws firmly.

5.1.6 Upper mark sensor replacing

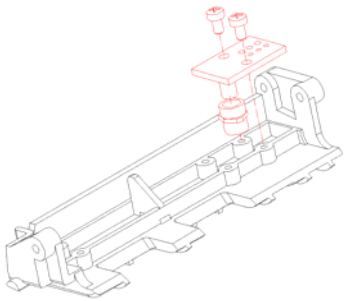
1) Turn off the power.
2) Disassemble the printer cover according to steps in 4.2.1, then detach the mark sensor connector form main control board.
3) Unscrew the 2 ST2.9X6 and take the moving blade module off.
4) Take off the E-ering, then take off gear 30 and gear 31-17.



5) Cut the wire tie shown in ①, unscrew the 2 ST2.6X6 and take off the upper channel module.



6) Unscrew the 2 ST2.2X4 screws，then take the mark sensor off.
7) Install a new mark sensor and reassemble by following these steps in reverse order.

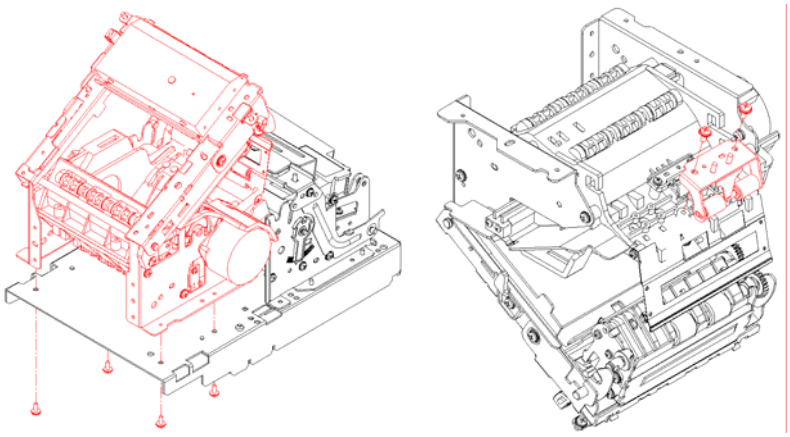


Notice：

- In disassembling the printer cover, please use moderate force to avoid damage the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Please make sure that all the connectors connect to their sockets firmly.
- Please avoid crushing the cable in reassembly.
- In reassembling, please fix all screws firmly.

5.1.7 Lower mark sensor replacing

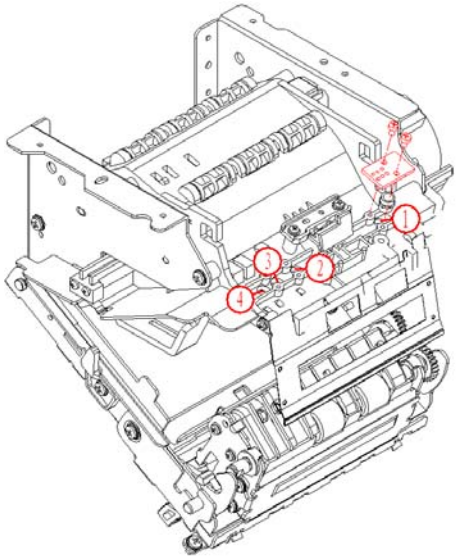
1) Turn off the power.
2) Disassemble the printer cover according to steps in 4.2.1, then detach the paper near end sensor, CR motor, paper end sensor, rear cover micro-switch and mark sensor from main control board.
3) Unscrew the 4 ST2.9X6 and take the paper holder module off.
4) Unscrew the 2 ST2.9X6 and take the float wheel module off.



5) Unscrew the 2 ST2.2X4 screws and take lower mark sensor off.
6) Install a new lower mark sensor and reassemble by following these steps in reverse order.

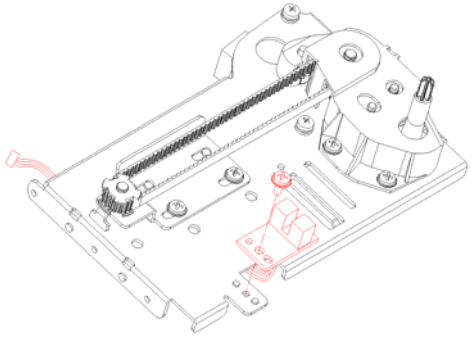
Notice：

- When the lower mark sensor is fixed in position ①, please replace sensor in above step. When the lower mark sensor is fixed in position ②③④, please over the step 4 above.
- In disassembling the printer cover, please use moderate force to avoid damaging the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Please make sure that all the connectors connect to their sockets firmly.
- Please avoid crushing the cable in reassembly.
- In reassembling, please fix all screws firmly.



5.1.8 HP sensor replacing

1) Turn off the power.
2) Disassemble the transmission module according to 4.2.5.
3) Unscrew the ST2.9X6 shown in the figure and take HP sensor off.
4) Install a new HP sensor and reassemble by following these steps in reverse order.

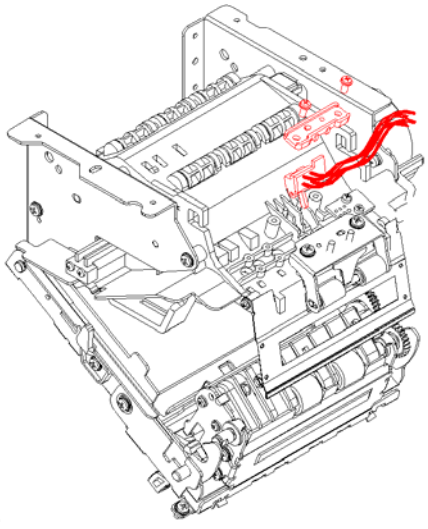


Notice：

- In disassembling the printer cover, please use moderate force to avoid damaging the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Please make sure that HP sensor connector connects to their sockets firmly.
- Please avoid crushing the cable in reassembly.
- In reassembling, please fix all screws firmly.

5.1.9 Paper sensor replacing

1) Turn off the power.
2) Disassemble the paper holder module according to step in 4.2.5.
3) Unscrew the 2 ST2.6X6 screws, then take paper sensor off.
4) Install a new paper sensor and reassemble by following these steps in reverse order.



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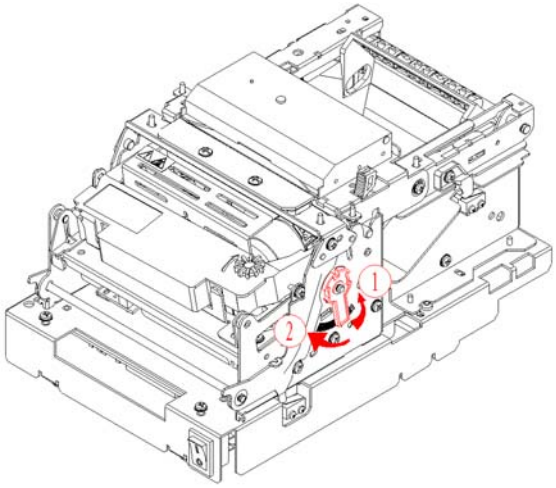
Notice：

- In disassembling the printer cover, please use moderate force to avoid damaging the cover.
- Please do not pull the cable when detaching the connector, so as to avoid breaking the cable.
- Please make sure that all connectors connect to their sockets firmly.
- Please avoid crushing the cable in reassembly.
- In reassembling, please fix all screws firmly.

5.2 Printer adjustment

5.2.1 Print distance adjustment

1) Turn off the power.
2) Disassemble the cover according to step in chap. 4.2.1 after the print head cool down.
3) Measure the print distance by gauge and compare with standard distance(0.5±0.05mm), if the distance is bigger than standard distance, please rotate the eccentric wheel both side in direction ① until the print distance measures up; If the print distance is less than standard distance, please rotate the eccentric wheel both side in direction ② until the print distance measures up.



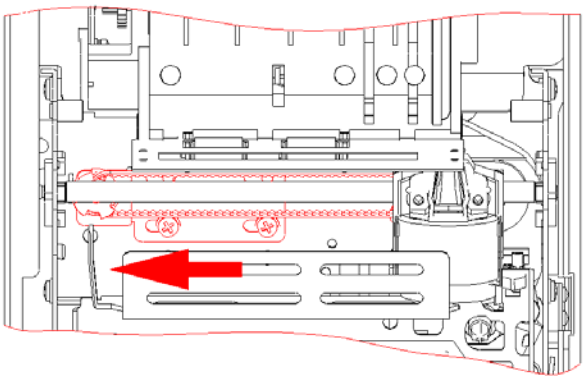
4) Fix the eccentric wheel with glue.
5) Install the cover according to chapter 4.2.1.

Notice：

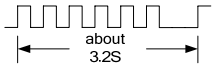
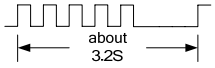
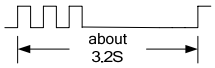
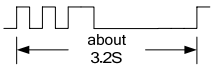
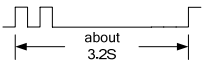
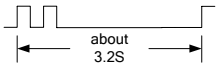
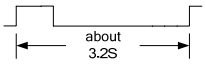
- In disassembling the printer cover, please use moderate force to avoid damaging the cover.
- In reassembling, please fix all screws firmly.

5.2.2 Tight denti-form belt of carriage

1) Turn off the power.
2) After the print head cool down, open the front cover and take ribbon off.
3) Unscrew the 2 ST2.9X6 screws, tighten the denti-form belt in shown direction(apx 1~2 kg), then fix the 2 screws.



6 Error Types and Processing

Errors	ERROR LED	PAPER LED	Buzzer	Recovery
HP Error		Off		Hold the FEED button, or send command DLE ENQ 2, or turn off & on the printer.
Print head overheateded		Off		Turn off printer power and wait for normal print head temperature
Voltage abnormal		Off		Turn off printer power and check input voltage
Cutter error		Off		Hold FEED buton, or send command DLE ENQ 2, or turn off & on the printer.
Upper cover open (unrecoverable)		Off		Send command DLE ENQ 2 after closing upper cover
Upper cover open (recoverable)		Off		Close upper cover
Front cover open		Off		Close front cover
Paper end		On		Replace roll paper
Paper near end		On		Replace roll paper

Note:

- The priority sequence of errors output from high level to low level is shown as below:
- HP Error > Print head overheateded > Voltage abnormal > Cutter error > Upper cover open
- Front cover open > Paper end > Paper near end.
- The execution method of upper cover open error can be set by command GS (E.
- When the cutter error occurs due to the paper jam, please turn off & on the printer after clearing paper jam.

7 Troubleshooting

If the printer works abnormally, consult this chapter below. If there are still problems that can not be solved, please contact your local dealer for assistance.

7.1 Print effect abnormal

1) **Problems:** Characters are not clear.

   Possible causes and solutions:

   - Ribbon ink is out, please change ribbon.
   - There might be a lot of dust on the print head, please clear it up.
   - Needles of the printer may be damaged. Please ask technical personnel to change printing distance or change print head.

2) **Problems:** Some characters dots are omitted.

   Possible causes and solutions:

   - Print head cable damaged, please ask technical personnel to change it.
   - Needles of the printer may be damaged, please ask technical personnel to change it.

3) **Problems:** Print color is mixed

   Possible causes and solutions:

   - The ribbon is loose, please turn the ribbon knob clockwise for 2-3 times to tighten the ribbon.
   - The nature life of ribbon is off, please change a new ribbon.
   - The ribbon is not installed in the right position, please install the ribbon again.
   - The dentiform belt is loose, please ask technical personnel to tighten it.
   - The print space is too small, please ask technical personnel to adjust the space.
   - The ribbon support plate is distorted, please ask technical personnel to modify or change it.
   - The paper force spring plate is distorted, please ask technical personnel to change it.

7.2 Paper detection abnormal

1) **Problems:** Printer alarm paper out mistakenly.

   Possible causes and solutions:

   - The paper end sensor is damaged, please check whether the sensor is normal or not, if abnormal, please replace the sensor;
   - The main control board is damaged, please replace the main control board.

7.3 Printing with noise

1) **Problems:** Noise is abnormal when feeding.

   Possible causes and solutions:

   - The paper feed motor is distorted，please replace it;
   - The paper feeding gear is damaged, please replace it.

2) **Problems:** The noise of carriage is abnormal.

Possible causes and solutions:

- The dentiform belt is too tighten, please adjust the position of the dentiform belt;
- The print gear is attrited, please replace it.

3) **Problems:** The noise is abnormal in color-switching.

Possible causes and solutions:

- The ribbon support plate is lack of lubricant, please ask technical personnel to add some.

7.4 Ribbon action abnormal

1) **Problems:** The ribbon is action less in printing.

Possible causes and solutions:

- The resistance of ribbon transmission is too big, please change a new ribbon cassette；
- The ribbon driving gear is damaged, please ask technical personnel to replace it.

2) **Problems:** Ribbon crush.

Possible causes and solutions:

- The ribbon is loose, please turn the ribbon knob clockwise for 2-3 times to tighten the ribbon.
- The nature life of ribbon is worn or damaged, please install a new ribbon cassette.
- The print space is too small, please ask technical personnel to adjust the space.
- The paper force spring plate is distorted, please ask technical personnel to replace it.

7.5 Cutter action abnormal

1) **Problems:** Cutting is not completely and noise is abnormal.

Possible causes and solutions:

- Wastepaper and dust accumulates too much in the cutter, please clean it;
- The cutter is worn or damaged, please ask technical personnel to replace it;
- The cutter is not installed in the right position, please ask technical personnel to check whether the installation of the cutter is correct or not.

2) **Problems:** Cutter can not be reset and sounds.

Possible causes and solutions:

- Paper is jammed in the cutter, please clear paper jam and repower the printer;
- The cutter wire is broken, please ask technical personnel to replace it;
- The sensor inside the cutter is damaged, please ask technical personnel to replace it.

Note: How to handle the problem when paper is jammed:

- Turn off the printer;
- Pull the upper cover spanner to open the front cover and upper cover;
- Close the upper cover after clearing paper jam;
- Keep away from the moving cutter blade to avoid damage due to blade reset, then power on the printer and the cutter is automatically reset.

Note:

- Please do not touch the stationary blade and the moving blade of the cutter to avoid damage when power on the printer.

7.6 Printer doesn't work

1) **Problems:** The printer doesn't work when power switch is on.

Possible causes and solutions:

- The power supply is not connected. Please check whether both sides power cable are connected correctly or not. If not, please connect it; Check whether the Host computer and the power supply are powered. If not, please connect it;
- The main control board is damaged, please replace it.

7.7 Problem during the printing process

1) **Problems:** HP error.

Possible causes and solutions:

- The tension of dentiform belt is too big, please adjust the tension (1kg~2kg force);
- The tension of dentiform belt is too small, please adjust the tension (1kg~2kg force);
- The space between the direction guide shaft and the bushing is too big, please replace the bushing;
- The load of carriage driving is too big, please check whether foreign body exists in the gears or not. If so, please clear it;
- The installation positon of HP sensor is not correct, please ask technical personnel to install it again;
- The wire of HP sensor is broken, please ask technical personnel to replace it;
- HP sensor is damaged, please ask technical personnel to replace it;
- The main control board is damaged, please ask technical personnel to replace it.

2) **Problems:** Paper out action is abnormal.

Possible causes and solutions:

- Paper is jammed, please clear paper jam;
- The load of paper feed driving is abnormal, please check whether foreign body exists in the gears or not. If so, please clear it;
- The wire of paper feed motor is damaged, please ask technical personnel to replace it;
- The paper feed motor is damaged, please ask technical personnel to replace it;
- The main control board is damaged, please ask technical personnel to replace it.

3) **Problems:** Paper feeding is continuously.

Possible causes and solutions:

- The current paper type is not accordant with the printer setting, please print self-test page to confirm the printer setting and use the correct paper.

Appendix

Appendix 1 Hexadecimal Dump Mode

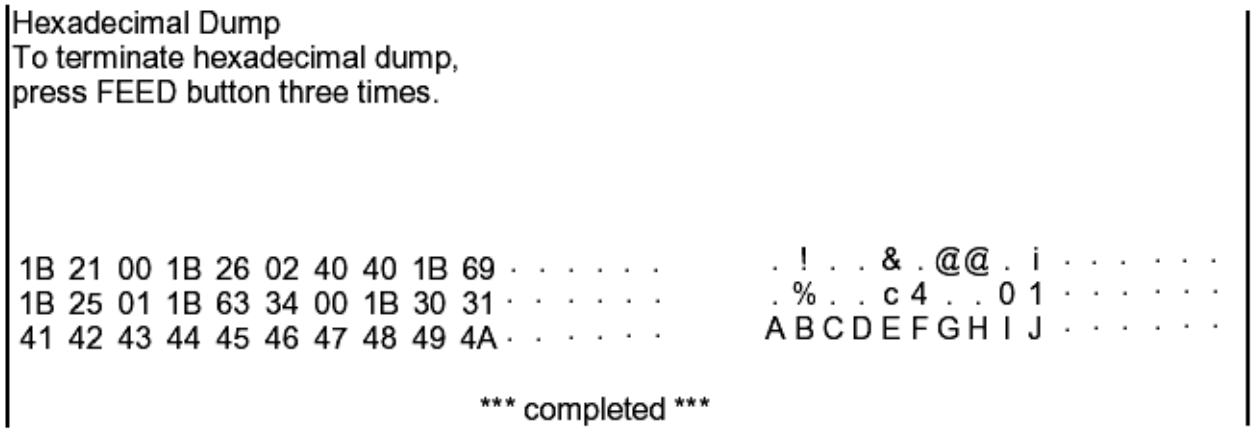
This feature allows the printer print in hexadecimal format after got data from host.

To use the hex dump mode, follow these steps:

- After you make sure that the printer is off, open the rear cover, then hold down the FEED button while you turn on the printer, after carriage was verified, release the FEED button. Close the rear cover after confirming there is paper, then the printer will enter into dump mode；
- Send command “1D 28 41 02 00 00 01”, the printer will enter into dump mode.

To exit Hexadecimal Dump mode, follow these step:

- Close the printer or push FEED button three times.


Hexadecimal Dump
To terminate hexadecimal dump,
press FEED button three times.
1B 21 00 1B 26 02 40 40 1B 69 . . . . . . ! . . & . @@ . i . . . . . .
1B 25 01 1B 63 34 00 1B 30 31 . . . . . . % . . c 4 . . 0 1 . . . . . .
41 42 43 44 45 46 47 48 49 4A . . . . . A B C D E F G H I J . . . . . .
*** completed ***

Appendix 2 Command list

Code	Hex	Dec	Function
HT	09	009	Horizontal tab
LF	0A	010	Print and line feed
CR	0D	013	Print and carriage return
DLE EOT n	10 04 n	016 004 n	Real-time status transmission
DLE ENQ n	10 05 n	016 005 n	Real-time request to printer
DLE DC4	10 14	016 020	Generate pulse at real-time
XON	11	017	Allow data back
XOFF	13	019	Forbid data back
ESC SP n	1B 20 n	027 032 n	Set right-side character spacing
ESC ! n	1B 21	027 033 n	Select print mode(s)
ESC % n	1B 25 n	027 037 n	Select/cancel user-defined character set
ESC &	1B 26	027 038	Define user-defined characters
ESC *	1B 2A	027 042	Select bit-image mode
ESC - n	1B 2D n	027 045 n	Turn underline mode on/off
ESC 2	1B 32	027 050	Select default line spacing
ESC 3 n	1B 33 n	027 051 n	Set line spacing
ESC <	1B 3C	027 060	Select peripheral device
ESC = n	1B 3D n	027 61 n	Cancel user-defined characters
ESC ? n	1B 3F n	027 063 n	Initialize printer
ESC @	1B 40	027 064	Set horizontal tab positions
ESC D	1B 44	027 068	Turn emphasized mode on/off
ESC E n	1B 45 n	027 069 n	Turn double-strike mode on/off
ESC G n	1B 47 n	027 071 n	Print and feed paper
ESC J n	1B 4A n	027 074 n	Select page mode
ESC K n	1B 4B n	027 075 n	Select character font
ESC M n	1B 4D n	027 077 n	Select an international character set
ESC R n	1B 52 n	027 082 n	Define user-defined characters
ESC U n	1B 55 n	027 085 n	Select /cancel unidirectional printing mode
ESC a n	1B 61 n	027 097 n	Select justification
ESC c 3 n	1B 63 33 n	027 099 051 n	Select paper sensor(s) to output paper-end signals
ESC c 4 n	1B 63 34 n	027 099 052 n	Select paper sensor(s) to stop printing
ESC c 5 n	1B 63 35 n	027 099 053 n	Enable/disable panel buttons
ESC d n	1B 64 n	027 100 n	Print and feed n lines
ESC e n	1B 65 n	027 101 n	Print and reverse feed n lines
ESC p m	1B 70 n	027 112 m	General pulse
ESC r n	1B 72 n	027 114 n	Select print color
ESC t n	1B 74 n	027 116 n	Select code page
ESC { n	1B 7B n	027 123 n	Select/cancel up-side printing
FS p n m	1C 70 n m	028 112 n m	Print NV bit image
FS q	1C 71	028 113	Download NV bit image
GS FF	1D 0C	029 012	Locate marked paper
GS (A	1D 28 41	029 040 065	Execute test print

GS (C	1D 28 43	029 040 067	Edit user date in NV
GS (D	1D 28 44	029 040 068	Open/close real-time command
GS (E	1D 28 45	029 040 069	User-defined command
GS (F	1D 28 46	029 040 070	Set black mark adjustment value
GS V	1D 56	029 086	Select cutter mode and cut
GS a n	1D 61 n	029 097 n	Enable/Disable Auto Status Back(ASB)
GS r n	1D 72 n	029 114 n	Transmit status
FS ! n	1C 21 n	028 033 n	Set character mode(s) for Kanji
FS &	1C 26	028 038	Select Kanji mode
FS - n	1C 28 n	028 045 n	Select/ Cancel Kanji underline mode
FS .	1C 2E	028 046	Cancel Kanji mode
FS 2	1C 32	028050	Define user-defined Kanji characters
FS ?	1C 3F	028 063	Cancel user-defined Kanji characters
FS C	1C 43	028 067	Select Japanese character
FS S	1C 53	028 083	Set left- and right-side Kanji character spacing
FS W	1C 57	028 087	Turn duple-size mode on/off for Kanji characters
ESC i	1B 69	027 105	Partial cut
ESC m	1B 6D	027 109	Partial cut
ESC u n	1B 75	027 117 n	Transmit peripherals status
ESC v	1B 76	027 118	Transmit paper status

Appendix 3 EEPROM setting table

EEPROM Address(HEX)	Instruction	Description
04	Print width	0：76mm，1：69.5mm，2：57.5mm
06	Print speed	416-1000 Steps/Second
12	Paper type	0: Continuous paper, 1: Black mark paper
14	CR（0x0D）command mode	0: Paper not feed, 1: CR equivalent LF
16	Baud rate	0：9600，1：19200，2：38400，3：57600
17	Data bits	7: 7bits, 8: 8 bits
19	Stop bit(s)	1: 1 bit, 2: 2 bits
1B	Parity	0: None, 1: odd, 2: even
7D	Rx buffer size	0: 4096 Bytes, 1: 40 Bytes
2A	Distance from cutter to print head	Indicated by feeding steps
2C	Distance from sensor to print head	Indicated by feeding steps
2E	Max. length of marked paper	Indicated by feeding steps
30	Cutter enable	0：Disable， 1：Enable
35	Distance from printing place to the mark	Indicated by feeding steps
37	Distance from cutting place to the mark	Indicated by feeding steps
40	Serial software handshaking enable	0: DTR/DSR, 1: Xon/Xoff
44	Stop printing when paper near end	0: disable, 1: enable
58	Buzzer	0: disable 1: enable
7E	Sending data when powered on	0: disable 1: enable

User can configure EEPROM by command:

[Format]	ASCII	ESC	s	B	E	a1	a2	data1	data2	n
	Hex	1B	73	42	45	92	9A	data1	data2	n
	Decimal	27	115	66	69	146	154	data1	data2	n

[Range] 0≤n≤127

a1 = 92h

a2 = 9Ah

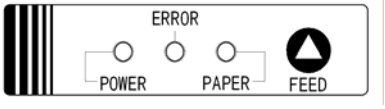
[Description] Write a WORD type data to EEPROM address indicated by n, data1 is low-bit data and data2 is high-bit data.

The configuration will be effecitive only after restart the printer.

Appendix 4 Spare part list

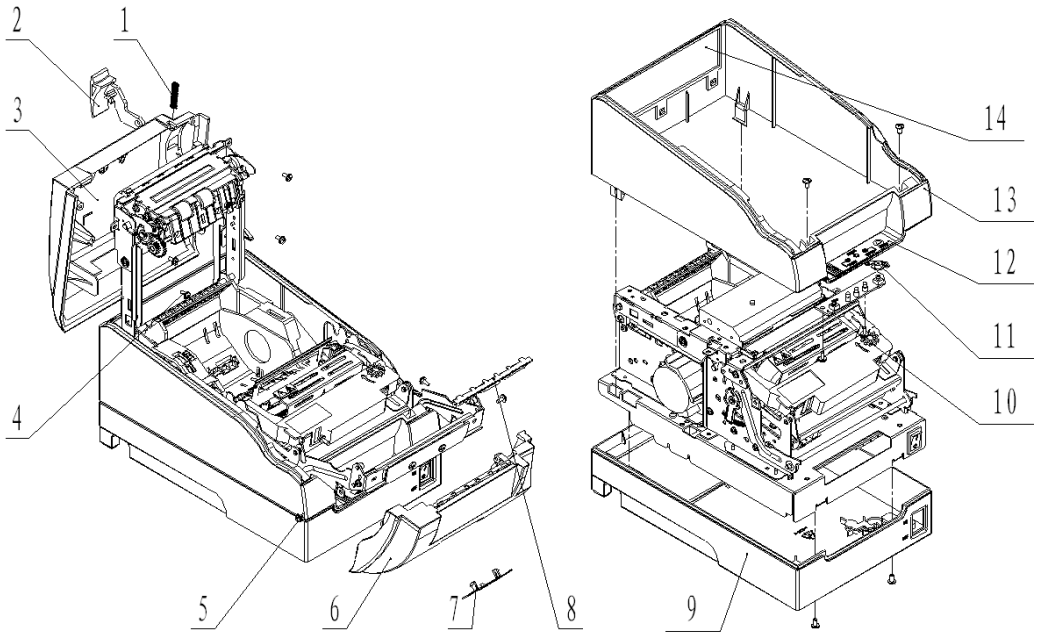
Parts	Part No.	Reference Picture
Impact head	3009-903780	
Print head flexible cable	7101-905477	
Ribbon drive gear	8203-900490	
Upper mark sensor	7600-906357	
Nether mark sensor	7600-905464	
Front cover micro switch	7600-905460	
Back cover micro switch	7600-905461	
Paper end sensor	7600-905462	
Paper near end sensor	7600-905525	

HP Sensor		7600-905463	
Platen roller		8301-904701	
Roller bushing		8211-900499	
HP bushing		8211-900651	
Paper guide part		8104-904621	
Paper feed step motor		3200-904997	
Printing step motor		3200-905905	
Belt gear	Initiative gear	8203-900487	
	Tensioner	8203-900488	

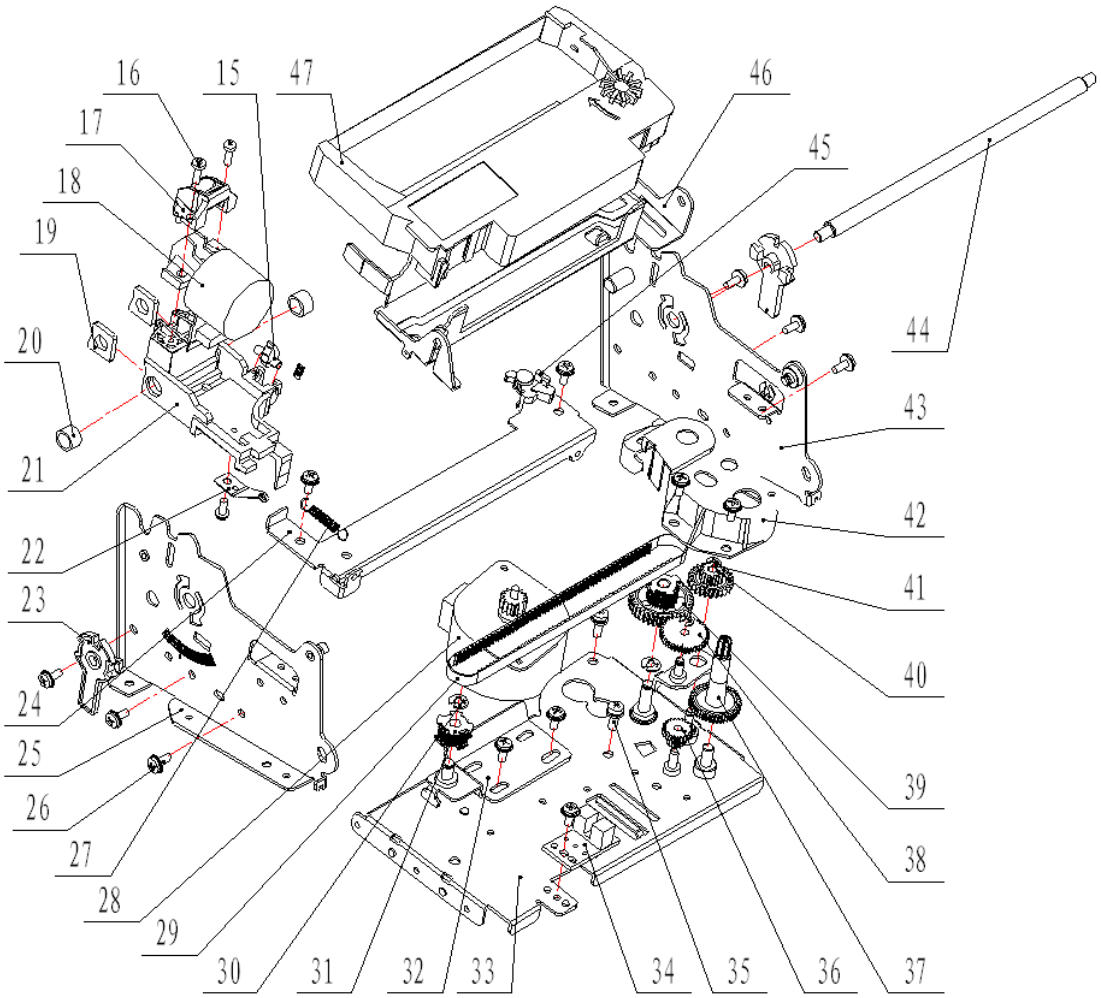
Paper feed gear	Platen roller gear	8203-900619	
	Transmission gear	8203-900594	
	Gear31-17	8203-901160	
Printing gear	Transmission Gear（25-19）	8203-900489	
	Gear 3（42-17）	8203-901158	
	Gear 1（25-15）	8203-901159	
Synchronization toothed belt		4930-901147	
Cutter		7600-905432	
Control board		7204-906053	
Feed button and LED module		7600-905465	
Keypad label		8205-904734	

Appendix 5 Exploded drawing of the printer

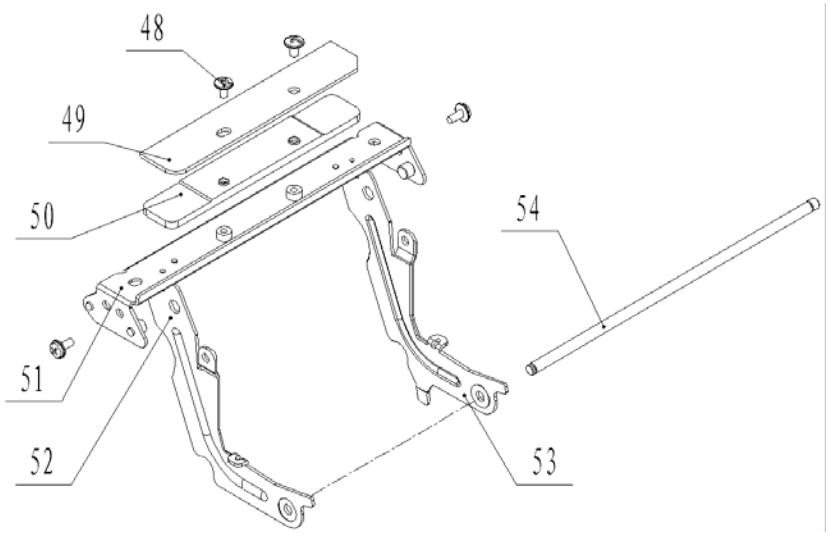
1 Explored drawing of the cover module



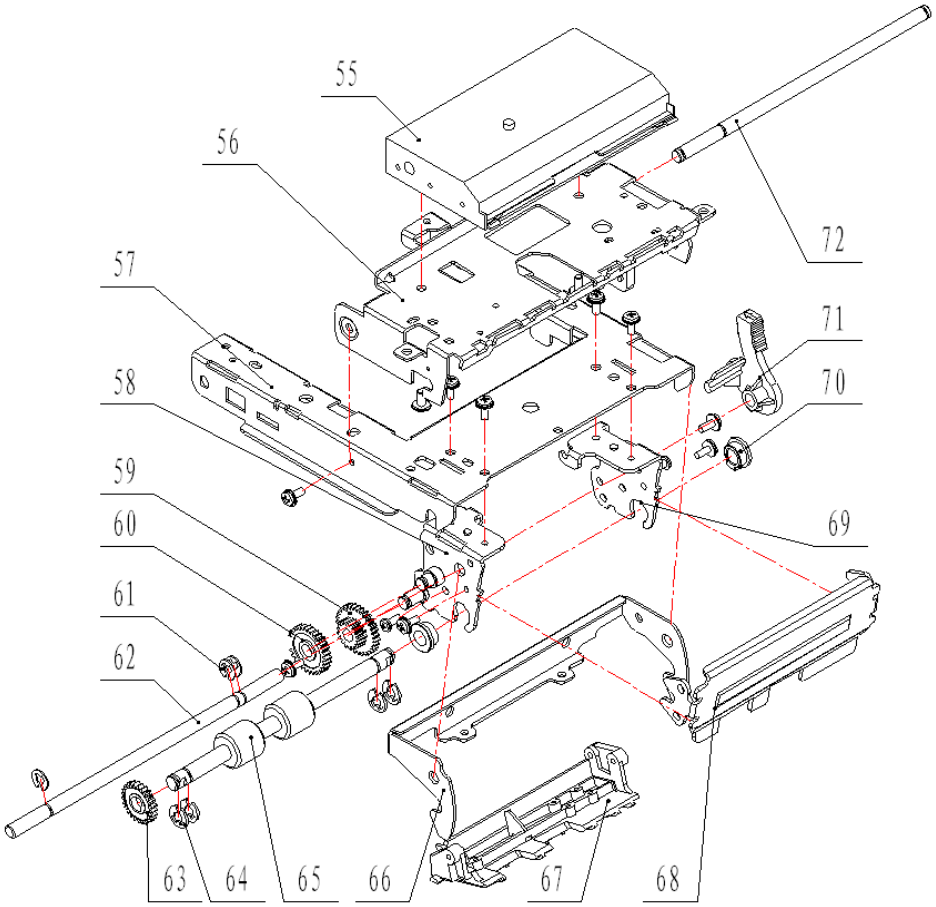
2 Explored drawing of the main plate module



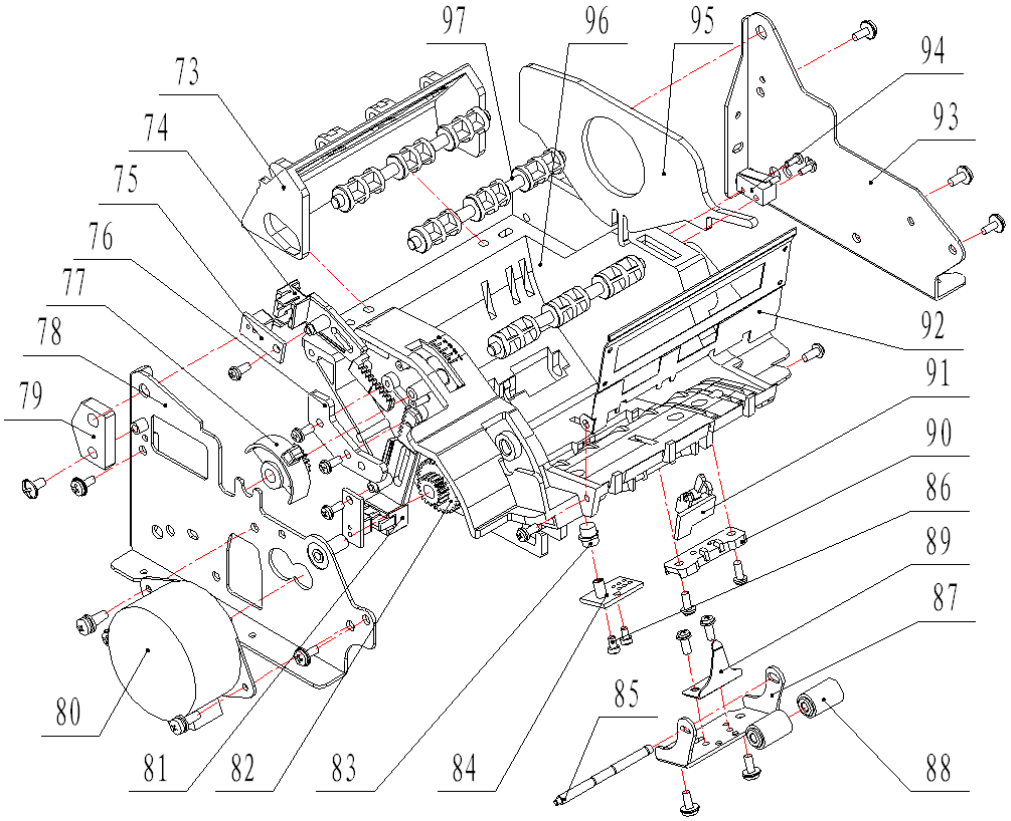
3 Explored drawing of stationary blade module



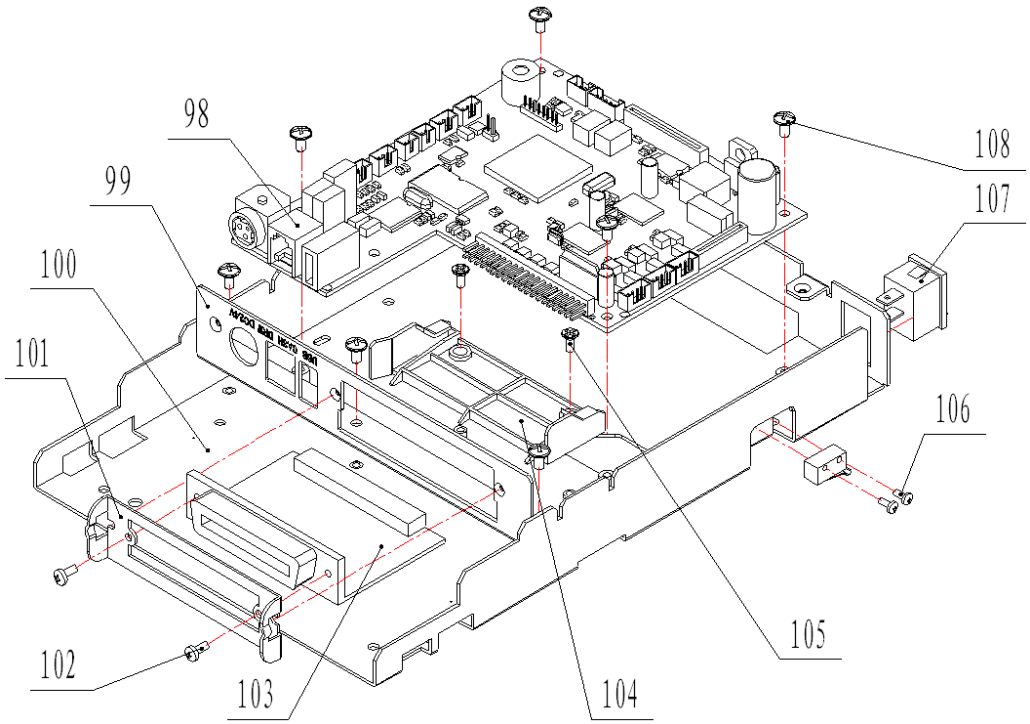
4 Explored drawing of roller module



5 Explored drawing of paper holder module



6 Explored drawing of main control board module



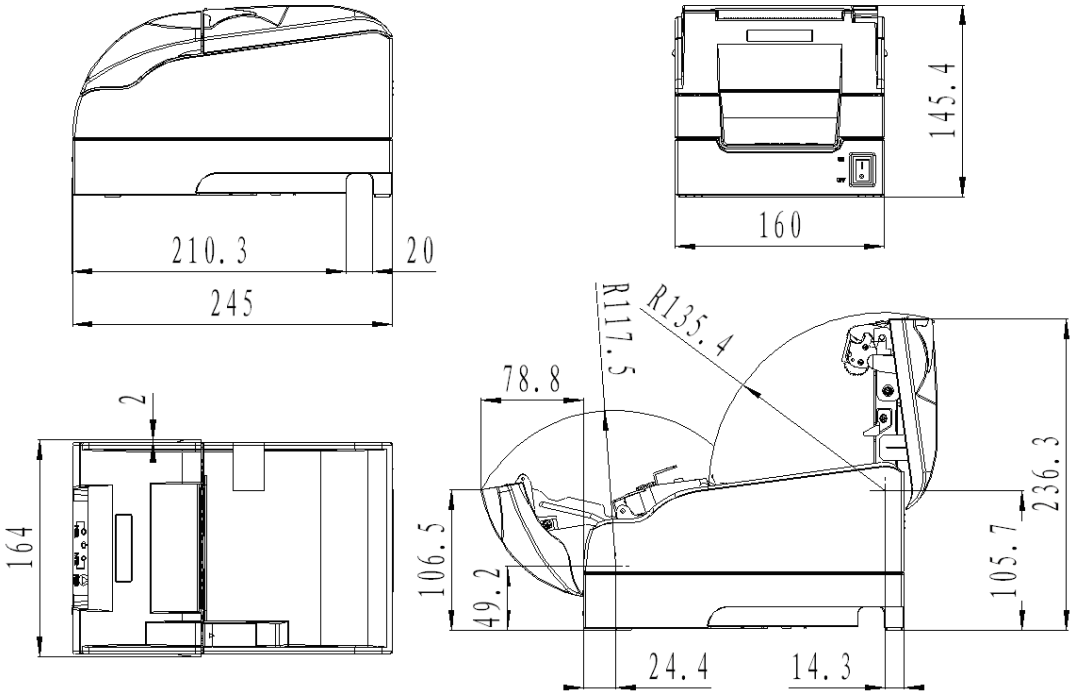
Appendix 6 Part list

No	Part No	Drawing No	Name	Number	Remark
1.	8005- 904688	BTP-M280.01.02.16R	Spanner spring	1	
2.	8209- 904680	BTP-M280.01.05.06R	Open button	1	
3.	8201- 904654	BTP-M280.01.05.01R	Rear cover（Without rewinder）	1	Black
	8201- 904664	BTP-M280.01.05.01R	Rear cover（Without rewinder）	1	White
4.	4002- 901335	ST2.9×8	Pan head self-drilling screw	10	
5.	4002- 900913	ST2.9×6	Pan head self-drilling screw	50	
6.	8201-904655	BTP-M280.01.05.02R	Front cover	1	Black
	8201- 904665	BTP-M280.01.05.02R	Front cover	1	White
7.	8201-904669	BTP-M280.01.05.07R	LOGO board	1	Black
	8201-904668	BTP-M280.01.05.07R	LOGO board	1	White
8.	8104- 904626	BTP-M280.01.07.01R	Manual cutter	1	
9.	8201- 904657	BTP-M280.01.05.04R	Lower cover	1	Black
	8201-904667	BTP-M280.01.05.04R	Lower cover	1	White
10.	7600-905465		Feed button	1	
11.	8209- 900912	TH200.01.08R	Feed button cap	1	
12.	8205- 904734	BTP-M280.BS.02R	Feed button label	1	
13.	8201- 904656	BTP-M280.01.05.03R	Middle cover	1	Black
	8201-904666	BTP-M280.01.05.03R	Middle cover	1	White
14.	8201- 904658	BTP-M280.01.05.05R	Middle cover plate	1	Black
	8201-904663	BTP-M280.01.05.05R	Middle cover plate	1	White
15.	8299- 904675	BTP-M280.01.01.12R	Impact block	1	
16.	4002- 900901	ST2.6*10	Pan head self-drilling screw	2	
17.	8299- 904671	BTP-M280.01.01.17R	Ribbon guide plate	1	
18.	3004-904961		Print head	1	
19.	8099-904692	BTP-M280.01.01.09.03R	Dust proof woolen washer	2	
20.	8211-900651	BTP-M270.01.06.14R	Left position bushing	2	
21.	8299-904678	BTP-M280.01.01.16R	Carriage	1	
22.	8104-904609	BTP-M280.01.01.09.01R	Carriage spring plate	1	
23.	8299-904676	BTP-M280.01.01.14R	Eccentricity bushing	2	
24.	8102-904610	BTP-M280.01.01.10.01R	Carriage holder plate	1	
25.	8102-904602	BTP-M280.01.01.02.01R	Mechanism left plate	1	
26.	4002- 900913	ST2.9×6	Pan head self-drilling screw	6	
27.	8005- 902358	BK-S216.01.04.19R	Lock hook spring	1	
28.	3200- 901678		Carriage motor	1	
29.	4930- 901147	96 MXL 019	Dentform belt	1	
30.	4400- 900292	Φ3.5	E-ring	7	
31.	8203- 900488	BTP-M270.01.03.18.04R	Tight wheel	1	
32.	8102- 904608	BTP-M280.01.01.08.01R	Fasten plate	1	
33.	8102- 904606	BTP-M280.01.01.06.01R	Ribbon drive plate	3	
34.	7600-905463		HP sensor	1	
35.	4000- 900297	M3×8	Screw module	6	

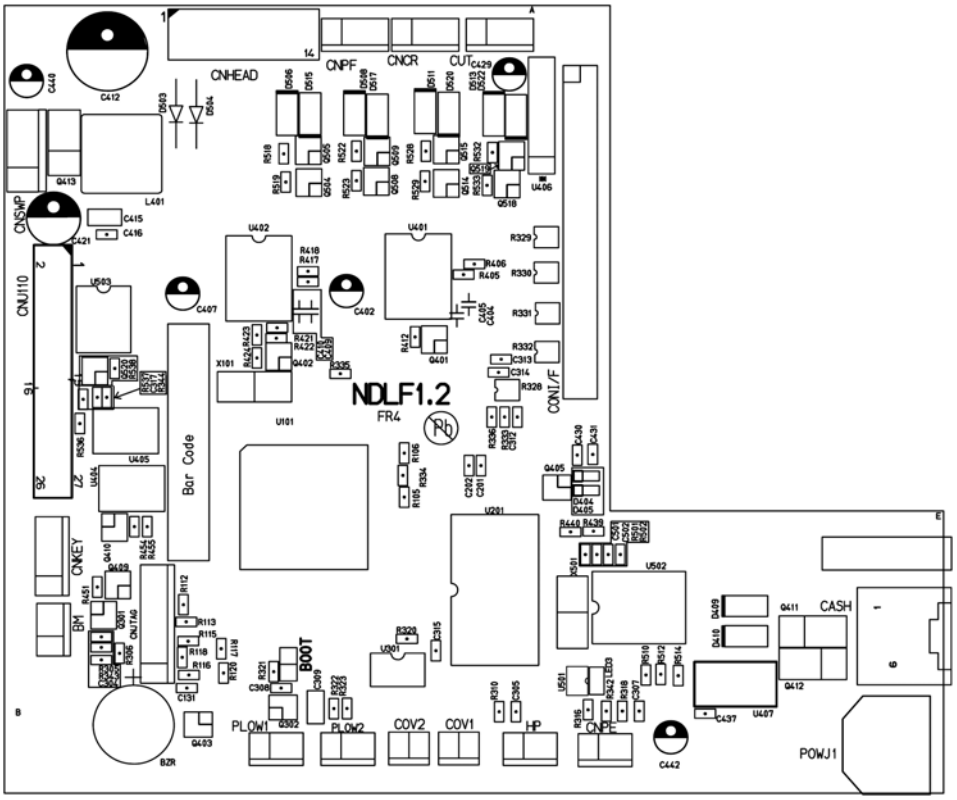
36.	8203-901159	BSC-2000A.01.24R	Scan gear 1	1	
37.	8203-900490	BTP-M270.01.03.18.07R	Ribbon drive gear	1	
38.	8203-901158	BX-7R	Gear 3	2	
39.	8203-900487	BTP-M270.01.03.18.02R	Driving wheel	1	
40.	8203-900489	BTP-M270.01.03.18.05R	Transmission gear	1	
41.	4400-900294	Φ2	E-ring	2	
42.	8299-904670	BTP-M280.01.01.15R	Gear dust proof cover	1	
43.	8102-904601	BTP-M280.01.01.01.01R	Mechanism right plate	1	
44.	8001-904643	BTP-1000PT.01.01.14R	Guide shaft	1	
45.	8299-904674	BTP-M280.01.01.12R	Plastic swing block	1	
46.	8102-904607	BTP-M280.01.01.07.01R	Ribbon support plate	1	
47.	6101-901146		Ribbon	1	
48.	4006-900295	M3×5	Sphere head screw	2	
49.	3100-905432		Stationary blade	1	
50.	8299-905382	BTP-M280.01.01.22R	Stationary blade plate	1	
51.	8102- 904603	BTP-M280.01.01.03.01R	Stationary blade plate	1	
52.	8102- 904605	BTP-M280.01.01.05.01R	Stationary blade left support plate	1	
53.	8102- 904604	BTP-M280.01.01.04.01R	Stationary blade right support plate	1	
54.	8001-904642	BTP-M280.01.01.19R	Stationary blade shaft	1	
55.	3100-905432		Moving blade	1	
56.	8102- 904616	BTP-M280.01.02.05.01R	Moving blade fixing plate(Without rewinder)	1	
57.	8102-904612	BTP-M280.01.02.01.01R	Roller holder	1	
58.	8102-904613	BTP-M280.01.02.02.01R	Roll left holder	1	
59.	8203-901160	BTP-L340.01.05.01.10-AR	Gear 31-17	1	
60.	8203-900594	BK-L2163DKPV.01.01.01R	Transmission gear	1	
61.	4400-900292	Φ3.5	E-ring	3	
62.	8001-904647	BTP-M280.01.02.09R	Hook shaft	1	
63.	8203-900619	BK-L2163DKPV.01.01.02R	Print roller gear	1	
64.	4400-900627	Φ4	E-ring	4	
65.	8301-904701	BTP-M280.01.02.11R	Roller	1	
66.	8102-904615	BTP-M280.01.02.04.01R	Hook	1	
67.	8299-904682	BTP-M280.01.02.13R	Upper channel plate	1	
68.	8102-904617	BTP-M280.01.02.07.01R	Print underlay plate	1	
69.	8102-904614	BTP-M280.01.02.03.01R	Roller tight holder	1	
70.	8211-900499	BTP-M270.01.06.11R	Roller bushing	1	
71.	8202-904679	BTP-M280.01.02.12R	Spanner	1	
72.	8001-904648	BTP-M280.01.02.10R	Rear shaft	1	
73.	8299-904708	BTP-M280.01.03.10R	Vertical paper holder	1	
74.	8207-900508	BTP-R280.01.01.11R	Sensor holder（Horizontal）	1	
75.	7600-905525		Paper near end sensor	2	
76.	8299-900507	BSC-R280.01.01.01R	Paper near end sensor spanner	1	
77.	8203-900484	BTP-M270.01.03.06R	Sensor spanner	1	
78.	8102-904620	BTP-M280.01.03.04.01R	Paper holder left plate	1	
79.	8302-904630	BTP-M280.01.03.14R	Damping washer	1	

80.	3200-904997		Paper feeding motor	1	
81.	8207-900509	BTP-R280.01.01.12R	Sensor holder（Vertical）	1	
82.	8203-901160	BTP-L340.01.05.01.10-AR	Gear 31-17	1	
83.	8299-904683	BTP-M280.01.03.12R	Dust proof cover of sensor	1	
84.	7600-905464		Lower mark sensor	1	
85.	8001-904650	BTP-M280.01.03.16R	Press paper shaft	1	
86.	4002-900282	ST2.2×4	Pan head self-drilling screw	2	
87.	8102-904618	BTP-M280.01.03.02.01R	Press paper wheel plate	1	
88.	8299-904677	BTP-M280.01.03.07R	Press paper wheel	2	
	8399-904702	BTP-M280.01.03.15R	Press paper bushing	2	
89.	8104-904622	BTP-M280.01.03.06.01R	Press paper wheel spring plate	1	
90.	8299-904672	BTP-M280.01.03.11R	Paper sensor plate	1	
91.	7600-905462		Paper sensor	1	
92.	8104-904621	BTP-M280.01.03.05.01R	Paper guide sprint plate	1	
93.	8102-904619	BTP-M280.01.03.03.01R	Paper holder right plate	1	
94.	7600-905461		Mirco-switch for upper cover	1	
95.	8299-904673	BTP-M280.01.03.13R	Paper roller guide	1	
96.	8299-904681	BTP-M280.01.03.09R	Paper holder	1	
97.	8299-901155	BTP-R280.01.01.10R	Paper roller shaft	3	
98.	7204-905519		Main control board	1	
99.	8102-904623	BTP-M280.01.04.02.01R	Interface plate	1	
100.	8102-904627	BTP-M280.01.04.01.01R	Control board cover	1	
101.	8103-900250	BTP-2002CP.01.02.05R	USB plate	1	
	8103-900144	BTP-2002CP II.01.02.04R	36 Pin parallel interface plate	1	
	8103-900249	BTP-2002CP.01.02.06R	25 Pin serial interface plate	1	
	8103-900397	YTW-01.01R	Ethernet interface plate	1	
102.	4000-900988	M2.5×5	Pan head screw	2	
103.	7201-902227	EZUPORT1.2	USB interface board	1	
	7201-902228	EZPNIBPORT1.11	36 Pin bi-direction parallel interface board	1	
	7201-902277	IFWI1.01	JK-W01 WLAB interface board	1	
	7201-900520	S25PORT1.2	25 Pin serial interface board	1	
104.	8210-900378	BTP-2000CPII.01.02.05R	Guide plate	1	
105.	4001-900165	M3×5	Sink-head screw	2	
106.	4000-900057	M2×8	Pan head screw	2	
107.	7600-905460		Power switch for front cover	1	
108.	4000-900300	M3×6	Pan head screw	4	

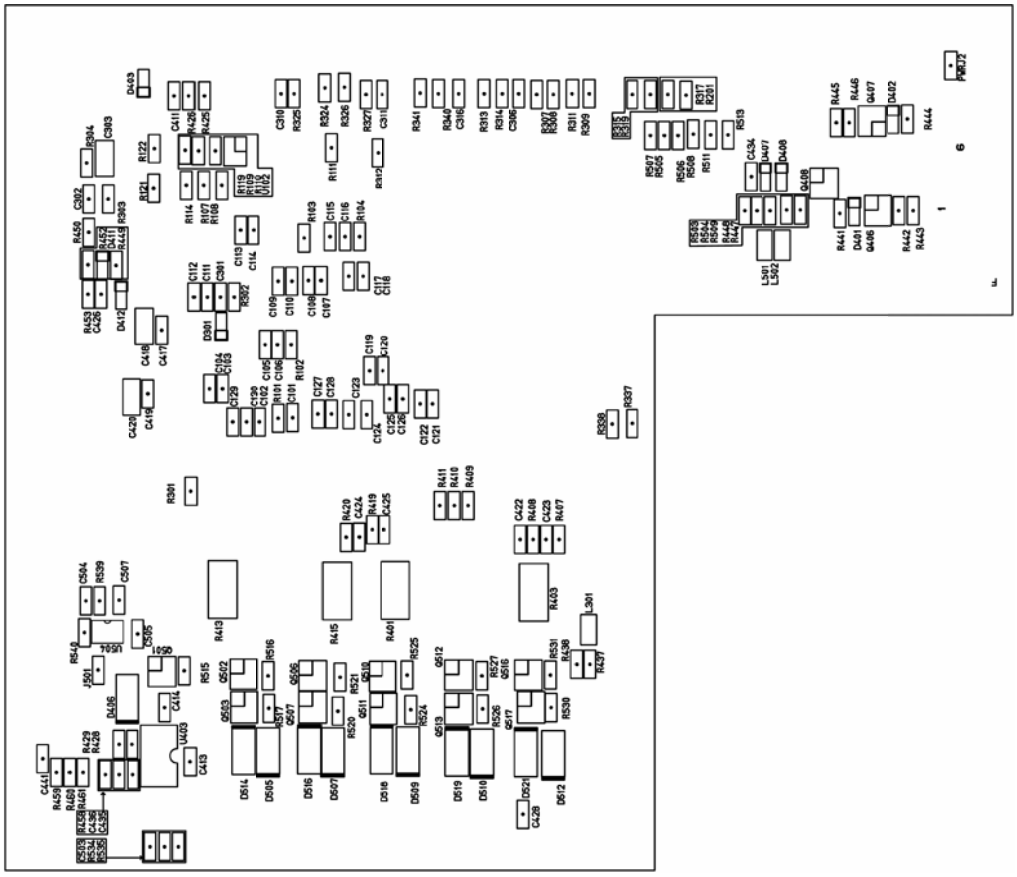
Appendix 7 Outline drawing



Appendix 8 Main board layout



Top side of Main control board



Bottom side of Main control board

Appendix 9 Lubrication

Please lubricate the printer according to following principle：

1) Please lubricate joint point of gear and gear shaft, do not lubricate gear tooth.
2) Please do not lubricate platen roller and its bushing.
3) Please lubricate the carriage guide shaft in maintenance.

Notice：

- Lubricate is special kind (EM50), please ask reseller or manufacture for advice.